

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees



VOL. 169, NO. 6

CHICAGO, ILLINOIS

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FEBRUARY 7, 1959

CIRCULATING BLOOD VOLUME CHANGES INCIDENT TO MAJOR ORTHOPEDIC SURGERY

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THE DEVELOPMENT of radioactive isotope dilution techniques for determination of blood and plasma volume has made possible the serial or repeated determination of circulating blood volume in humans with reasonable accuracy and ease.¹ Clinical medicine and surgery is thus provided with another means of measurement of one of the factors vital to the patient's general well-being. The objective of this study is to determine those changes which occur in the circulating blood volume in individuals who undergo the common major orthopedic procedures associated with significant blood loss.

In this study, immediate preoperative and postoperative circulating blood volume determinations were done on 37 patients who were subjected to major orthopedic procedures. These procedures were selected as representative of routine major orthopedic surgical practice. The operation was, in each instance, done by a fully qualified orthopedic surgeon. Routine anesthetic techniques were utilized. Transfusions were given as indicated clinically, and the exact volume of whole blood transfused in the interval between blood volume determinations was carefully recorded. It is assumed that the major factor responsible for the

Changes in blood volume during major surgery were studied in 37 patients. In each, the blood volume was determined first after induction of anesthesia and again after closure of the skin incision. The method depended on the intravenous injection of a precisely measured amount of radioiodinated serum albumin and the determination of the resultant intensity of radioactivity in the circulating blood. The reliability of the method was determined by a test-retest procedure in three volunteer subjects. The results, corrected to take into account the blood given by transfusion during the operations, showed that major orthopedic surgery involves significant loss of blood. Transfusions were given to 32 patients, and among these there were 5 in whom the deficit of blood would have amounted to more than 1,000 cc., had they not received transfusions. The use of radioactive elements to measure blood volume helps in estimating transfusion needs.

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TABLE 2.—Blood Volume Determinations in Surgical Patients, Grouped According to Surgical Procedure

Case	Procedure	Age, Yr.	Sex	Blood Volume				Transfusion, Cc.	Total Uncompensated Blood Volume Change	
				1st Determination, Cc.	2nd Determination, Cc.	Change			Cc.	%
						Cc.	%			
Fresh Fracture About Hip and Proximal Femur										
1	Closed reduction, intertrochanteric fracture, left femur; internal fixation with Smith-Petersen nail and plate	68	F	3,461	2,990	-471	-10.7	440	-991	-26.3
2	Closed reduction, intracapsular fracture, femoral neck, with blind hip nailing	84	F	4,167	4,009	-158	-3.7	430	-588	-14.1
3	Closed reduction, intertrochanteric fracture, right femur; internal fixation with Smith-Petersen nail and attached plate	82	M	4,541	4,413	-128	-2.8	723	-851	-18.7
4	Open reduction and internal fixation, subtrochanteric fracture, femur, with Smith-Petersen nail and plate	88	F	2,693	2,636	-57	-2.1	440	-497	-18.5
5	Closed reduction, intertrochanteric fracture, right femur; internal fixation with Smith-Petersen nail and attached plate	74	F	3,090	3,071	-19	-0.6	870	-889	-23.8
6	Closed reduction, intertrochanteric fracture, left femur; internal fixation with Smith-Petersen nail and attached plate	76	F	2,868	2,944	+76	+2.6	460	-384	-13.4
7	Closed reduction, intertrochanteric fracture, left femur; internal fixation with Smith-Petersen nail and attached plate	75	F	2,958	3,268	+310	+10.5	840	-530	-18.0
8	Closed reduction, intertrochanteric fracture, right femur; internal fixation with Smith-Petersen nail and attached plate	86	F	3,268	3,659	+391	+12.0	880	-489	-15.0
9	Closed reduction, intracapsular fracture, neck of the right femur; internal fixation with Smith-Petersen nail and attached plate*	87	M	4,347	5,298	+951	+21.2	440	+511	+12.0
Reconstructive Procedure About Hip										
10	Excision of femoral head and insertion of Eicher hip prosthesis through posterior (Gibson) approach	56	F	4,034	3,319	-715	-17.6	890	-1,605	-39.8
11	Cup arthroplasty through anterior iliofemoral approach	63	M	5,478	4,908	-570	-10.4	845	-1,415	-25.8
12	Cup arthroplasty, left hip, through anterior iliofemoral approach	38	M	5,099	4,915	-184	-3.6	860	-1,044	-20.5
13	Arthrodesis, right hip, through anterior iliofemoral approach	10	F	2,645	2,448	-197	-7.4	415	-612	-23.1
14	Excision of femoral head and insertion of Eicher hip prosthesis, right, through anterior iliofemoral approach	73	F	2,178	2,399	+221	+10.1	840	-619	-28.4
15	Arthrodesis, left hip, through anterior iliofemoral approach	14	M	2,674	2,979	+305	+11.4	880	-575	-21.5
Intervertebral Disk Excision Without Fusion										
16	Left partial lumbar hemilaminectomy and excision of protruded intervertebral disk L-3	42	M	7,498	7,124	-374	-5.0	None	-374	-5.0
17	Left partial hemilaminectomy and excision of intervertebral disk L-4	52	M	6,515	5,796	-719	-11.0	None	-719	-11.0
Combined Intervertebral Disk Exploration and Spine Fusion										
18	Exploration and excision, intervertebral disk, L-5; spine fusion L-5 to S-1	39	M	5,551	4,957	-594	-10.7	None	-594	-10.7
19	Exploration, intervertebral disk, L-4 and L-5; spine fusion L-4 to S-1	56	F	4,051	3,491	-560	-13.8	420	-980	-24.2
20	Exploration and excision of herniated intervertebral disk, L-5, and spine fusion L-5 to S-1	27	M	4,255	4,028	-227	-5.3	440	-667	-15.7
21	Exploration, intervertebral disk, L-4; exploration and excision of disk, L-5; spine fusion L-5 to S-1	39	F	4,694	4,477	-217	-4.6	440	-657	-14.0
22	Exploration, intervertebral disk, L-4 and L-5; excision of disk, L-4; spine fusion L-4 to S-1	37	M	5,623	5,533	-85	-1.5	None	-85	-1.5
23	Exploration and excision, intervertebral disk, L-4, and spine fusion L-4 to L-5	36	F	3,376	3,465	+89	+2.6	430	-341	-10.1
24	Exploration, intervertebral disk, L-4 and L-5, and spine fusion L-4 to L-5	35	M	4,333	4,470	+137	+3.2	420	-283	-6.5
25	Exploration and excision, intervertebral disk, L-5, spine fusion L-5 to S-1	46	F	3,350	3,496	+146	+4.4	440	-294	-8.8
26	Exploration, intervertebral disk, L-5, spine fusion L-4 to S-1	55	F	4,090	4,622	+532	+13.0	870	-338	-8.3
27	Exploration, intervertebral disk, L-4 and L-5, spine fusion L-4 to sacrum*	29	M	5,514	6,598	+1,084	+19.7	890	+194	+3.5
Spine Fusion at Various Levels										
28	L-4 to S-1	37	F	4,585	4,025	-560	-12.2	430	-990	-21.6
29	L-5 to S-1	43	F	3,601	3,253	-348	-9.7	None	-348	-9.7
30	For scoliosis, D-II to D-5	10	M	2,160	1,909	-251	-11.0	410	-661	-30.6
31	C-4, C-5, and C-6	30	F	3,231	3,033	-198	-6.0	694	-892	-27.6
32	L-4 to S-1	54	M	3,607	4,128	+521	+14.4	420	-99	-2.6
Major Extremity Surgery Without Tourniquet Control										
33	Reconstruction coracoclavicular ligament with fascial strip	48	M	5,872	4,755	-1,117	-19.0	430	-1,547	-26.4
34	Open reduction and internal fixation, fracture medial femoral condyle	68	F	4,876	4,288	-588	-12.0	440	-1,028	-21.1
35	Osteotomy, shaft of right femur, and internal fixation with intramedullary Kuntscher nail and bone graft to site of osteotomy; bone grafts obtained from iliac crest	36	F	2,536	2,851	+315	+12.4	890	-575	-22.7
36	Open reduction and internal fixation with Kuntscher nail; fracture of shaft of left femur	14	F	3,130	3,636	+506	+16.1	880	-374	-12.0
37	Open reduction and internal fixation with intramedullary Kuntscher nail; femur, shaft, mid-third	22	F	3,229	3,940	+711	+22.0	835	-124	-3.9

* Findings considered to represent laboratory error.

change in blood volume between the first and second determinations is the blood loss and surgical trauma incident to the procedure. Transfusions were used deliberately in excess of the suspected surgical blood loss in those instances where a low preoperative hemoglobin level and red blood cell count were reported. This was particularly true with respect to elderly patients with recent fractures about the hip. No instance of clinically detectable overtransfusion occurred. There were no transfusion reactions of either major or minor degree.

Method of Blood Volume Determination

A standard technique of blood volume determination with use of radioiodinated (I^{131}) human serum albumin (Risa) was adopted for the purpose of this study.² The use of radioactive chromium-tagged red blood cells was considered but was not adopted because it was technically more complex and time-consuming. Circulating blood volume determinations were calculated from the dilution of a precisely measured amount of radioiodinated serum albumin injected intravenously. The injected material

TABLE 1.—Blood Volume Determinations in Volunteer Normal Control Subjects

Subject	Blood Volume			
	1st Determination, Cc.	2nd Determination, Cc.	Change	
1.....	5,256	5,010	-246	-4.6
2.....	5,112	4,836	-276	-5.3
3.....	6,430	6,594	+164	+2.4

is thoroughly mixed with the plasma in less than 10 minutes, and the albumin molecules remain within the circulating vascular compartment.

If a blood sample is drawn from another vein, the blood volume can be determined as follows: Counts injected equal cubic centimeters injected, multiplied by the counts per cubic centimeter of standard, multiplied by the dilution factor of the standard. Counts injected equal counts per cubic centimeter of blood multiplied by the blood volume; therefore, blood volume equal the cubic centimeters injected, multiplied by counts per cubic centimeter of standard, multiplied by the dilution factor of the standard, and divided by counts per cubic centimeter of blood.

In this study, blood volume determinations were done immediately after induction of anesthesia and prior to the commencement of surgery, allowing 10 minutes from the time of injection before collecting a specimen of blood. A second determination of blood volume was made with use of a second injection of radioiodinated serum albumin made immediately after the closure of the skin incision. A scintillation well type of counter was used to measure radioactivity of the specimens. Background determination of radioactivity before each injection

made possible serial blood volume determinations. Transfusions of intravenously given saline solution or other fluid injections were used as indicated clinically. The amount of transfusion was carefully measured, and the volume of transfusion given between the two blood volume determinations was recorded. The difference between the first and second blood volume determinations was considered to be secondary to the surgical procedure and to the amount of whole blood transfused into the patient during the time interval between the first and second determinations. An accuracy of $\pm 6\%$ is considered average with the radioiodinated serum albumin dilution techniques.

Results

The technique utilized in this study was first standardized in dogs, after which three volunteer subjects submitted to serial blood volume determinations. These were done 30 minutes apart with two injections of radioiodinated serum albumin used in the same manner as was carried out in the study of surgical patients. Results of this preliminary study are presented in table 1.

The results of this study applied to surgical patients are shown in table 2. Cases are grouped according to the surgical procedure involved. Tabulations are made in order of change in blood volume, from those showing the greatest diminution of blood volume during the particular procedure to those showing the largest gain.

Summary

Major orthopedic surgery involves significant blood loss. This is of particular importance in elderly and young persons in whom a given increment of blood lost at surgery is likely to represent a high proportion of the preoperative circulating blood volume.

Transfusion during surgery is urgently indicated where clinical evidence indicates significant blood volume loss. Blood volume studies with radioactive elements offer a useful adjuvant in estimating transfusion requirements during or after surgery. It is of most value when a preoperative determination is available.

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This study was supported by a grant from the Midwest Medical Research Foundation.

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ASSOCIATION OF HEMADSORPTION VIRUSES WITH RESPIRATORY ILLNESS IN CHILDHOOD

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A previous report¹ described the recovery of two new myxoviruses, type 1 and type 2 hemadsorption viruses, from children with acute respiratory disease, such as croup, pneumonia, and severe pharyngitis. During primary passage of the hemadsorption viruses in tissue culture, minimal cell destruction was observed. However, adsorption occurred when guinea pig erythrocytes were added to infected tissue cultures. This phenomenon, called hemadsorption, permitted rapid recognition and identification of these agents.²

Evidence was obtained that type 1 virus was etiologically associated with an outbreak of febrile respiratory illness with pneumonitis in a nursery population.¹ However, the experience with type 2 virus was insufficient to establish an association with illness.

The present study is part of a larger enquiry concerning the etiology of respiratory illness in which the contribution and importance of known and suspected viral pathogens is being assessed. The present investigation was carried out (1) to determine the role, if any, of type 2 virus in respiratory illness, (2) to obtain additional information about type 1 virus and its contribution to various respiratory disease syndromes, and (3) to elucidate the epidemiology and seasonal distribution of these agents.

Methods

Virus Isolation.—Monkey kidney tissue cultures maintained in Eagle's basal medium were inoculated with 0.2 ml. of throat swab fluid and incubated for five days at 37 C. Then 0.2 ml. of a 0.4% suspension of guinea pig erythrocytes was added and the cultures were placed at 4 C for 20 minutes. The tissue cultures were then examined microscopically for adsorption of red blood cells to the monkey kidney monolayer. If hemadsorption occurred, the tissue culture fluid was passed into a series of cultures for identification. Cultures that did not show adsorption of red blood cells at five days were fed with fresh maintenance fluid and tested again at five-day intervals for an additional 20 days.

Identification of Virus.—The hemadsorption-inhibition test was used for identification of virus isolates. After two days' incubation, the second-

Hemadsorption, a specific phenomenon dependent on the hemagglutinating property of the virus, was observed in two viruses newly recovered from children with acute respiratory disease. In a study involving 1,738 children in three hospitals, one or the other of the two hemadsorption viruses was recovered from 54 (6%) of 859 patients with respiratory disease. It appeared that the two viruses were capable of causing a wide variety of clinical manifestations, including croup, pneumonia, bronchiolitis, pharyngitis, and mild afebrile disease. Serologic studies suggested that approximately 20% of the respiratory illness severe enough to require hospitalization in the Washington, D. C., area in 1957-1958 was associated with hemadsorption virus infection.

passage monkey kidney cultures were washed twice with Hank's balanced salt solution; 0.6 ml. of this solution and 0.2 ml. of a 1:10 dilution of inactivated specific rabbit serum treated with potent receptor destroying enzyme of *Vibrio cholerae* (RDE) was then added. The serum was incubated with the culture for 20 minutes at room temperature, after which guinea pig red blood cells were added and the tubes examined after standing for 20 minutes at 4 C. The isolates were identified by the serum that prevented hemadsorption. The first 26 isolates, 12 of which were type 1 and 14 of which were type 2, were also typed by the conventional hemagglutination-inhibition technique, and the results agreed with those obtained by the hemadsorption-inhibition test.

Serology.—Antibody for type 1 or type 2 virus was tested for by the complement-fixation technique. Type 2 complement-fixation antigen was prepared from monkey kidney cultures by sonic disruption of infected cells in the 10-kilocycle Raytheon oscillator for five minutes at 0 C, followed by clarification at 2,000 rpm in the International PR-1 refrigerated centrifuge. Type 1 complement-fixation antigen consisted of both fluid and disrupted cells from infected KB tissue culture flasks. Disruption was accomplished by rapidly freezing and thawing the culture five times. In the complement-fixation

From the Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Public Health Service, U. S. Department of Health, Education, and Welfare (Drs. Chanock, Cook, Kapikian, and Reichelderfer), and the Virus Section, Research Foundation, Children's Hospital of the District of Columbia (Drs. Chanock, Vargosko, and Parrott and Miss Luckey).

test, 2 full units of complement, 4 units of antigen, and overnight fixation at 4 C were used. The lowest initial serum dilution tested was 1:8, and a fourfold rise in antibody was considered indicative of infection.

Study Population.—The study population consisted of infants and children who were brought to the hospital with respiratory illness and a control group of infants and children of the same low socioeconomic background who did not have respiratory illness at the time the specimens for virus isolation were obtained—a total of 1,738 children. A careful medical history was taken for each patient with respiratory illness. The results of the physical examination were recorded at the time the patient was first seen. These findings, as well as the patients' course and the results of the x-ray studies, were evaluated before a subject was assigned to a specific disease category. Final assignment to a diagnostic category was made without

of bacterial pathogens as that described for the entire group. This incidence does not differ significantly from the values obtained by Rabe³ for a group of healthy children studied during the winters of 1937 to 1946 in New Haven, Conn.

Approximately three-fourths of the infants and children with mild respiratory illness studied in the outpatient clinic had a fever (rectal temperature of 100 F [37.7 C] or greater) during the course of their illness. The temperature usually remained elevated one to two days and rarely exceeded 104 F (40 C). Bacterial cultures were not taken in this group, but the clinical impression was that of a nonbacterial illness.

Method of Study.—The same procedure was employed in studying the group with respiratory illness and the control group without such disease. A single throat swab in Hank's balanced salt solution was obtained from those with respiratory disease at the time of admission to the hospital or

TABLE 1.—Composition of Study Groups by Time, Sex, and Age

	No. Tested, 1957-1958								Sex		Mean Age, Mo.	
	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Total	Male, %		Female, %
Respiratory illness												
Inpatient												
Pneumonia	49	23	39	42	26	27	33	5	244	58.1	41.9	27.8
Croup	19	9	6	3	8	3	4	2	54	74.0	26.0	22.9
Bronchiolitis	9	13	10	7	4	18	15	1	77	55.5	44.5	11.3
Pharyngitis*	8	7	14	5	10	2	8	3	57	61.2	38.8	33.4
Outpatient (mild respiratory disease)												
Febrile	0	28	10	105	71	85	5	7	311	51.2	48.8	26.6
Afebrile	0	0	0	54	21	23	2	5	108	48.1	51.9	25.0
Undetermined	0	0	3	14	7	3	1	0	28	50.0	50.0	31.5
Total	85	80	82	230	150	161	68	23	879	54.5	45.5	26.4
No respiratory illness												
Inpatient	37	26	30	48	29	17	30	6	223	60.9	39.1	38.8
Outpatient	—	3	8	233	84	50	170	88	636	51.6	48.4	28.3
Total	37	29	38	281	113	67	200	94	859	54.0	46.0	31.0

* Including patients with pharyngitis and bronchitis combined or mild pharyngeal component with bronchitis predominating.

knowledge of the virus isolation results. The composition of the study groups, according to diagnosis, time of study, sex, and mean age, is shown in table 1.

The studies were conducted at three hospitals in the Washington, D. C., area—Children's Hospital of the District of Columbia, District of Columbia General Hospital, and Georgetown University Hospital. The distribution of the individuals studied in the three hospitals is shown in table 2.

The detailed description of the clinical illnesses will be presented in subsequent publications. Suffice it to say that the illness of the vast majority of patients with croup, pneumonia, bronchiolitis, or pharyngitis did not appear to be associated with a primary bacterial etiology. Consistent with this clinical impression was the finding that beta hemolytic streptococcus was isolated from 8%, *Diplococcus pneumoniae* from 16%, and *Hemophilus influenzae* from 5% of this group. Patients with respiratory disease with evidence of hemadsorption type 1 or type 2 infection had the same incidence

during the first clinic visit. This assured that the virus isolations were not derived from infections acquired in the hospital. Similarly, throat swabs were obtained from hospital control patients on admission to the hospital. Clinic control subjects were selected from among persons who had not visited the hospital within a 10-day period.

Results

Virus Isolation.—In order to elucidate the role of the hemadsorption viruses in respiratory illness, a controlled study was performed. The plan of the study was to compare the frequency of virus isolation from patients with respiratory disease with those from a group with no evidence of such illness. The latter group served as time, place, and age controls. As seen in table 1, the mean age of the respiratory group was 26.4 months, while that of the control group was 31 months. As mentioned under "Methods," the specimens were collected in such a manner as to exclude the possibility that virus isolations represented infection acquired in the hospital.

As shown in table 2, type 1 virus was isolated 20 times more frequently from patients with respiratory illness than from controls without such illness. Similarly, type 2 virus was recovered 34 times

TABLE 2.—Association of Hemadsorption Viruses with Acute Respiratory Illness

Hospital	Respiratory Illness				No Respiratory Illness			
	No. of Isolations				No. of Isolations			
	No. Tested	Type 1	Type 2	Total	No. Tested	Type 1	Type 2	Total
Children's Hospital of the District of Columbia	714	15	31	46	750	1	1	2
District of Columbia General Hospital	155	4	3	7	105	0	0	0
Georgetown University Hospital	10	1	0	1	4	0	0	0
Total	879	20	34	54	859	1	1	2

more frequently from individuals with respiratory disease. It is important to note that the hemadsorption viruses were recovered exclusively or almost exclusively from patients with respiratory disease in each of the three hospitals in the study. These findings suggest an etiological association between the hemadsorption viruses and a certain segment of respiratory disease occurring in the Washington, D. C., area during 1957-1958.

Type 1 virus was recovered from infants and children with each of the respiratory disease syndromes under study (table 3). The recovery rate of type 1 virus did not vary appreciably among the patients with pneumonia, croup, bronchiolitis, pharyngitis, or mild respiratory tract disease, the average rate being 2.3%.

Type 2 virus was recovered from individuals with croup, pharyngitis, or mild illness. The highest isolation rate for either virus was observed for type 2 in the croup syndrome (16.7%). The overall recovery of type 2 virus (3.9%) was somewhat higher than that for type 1 virus (2.3%).

TABLE 3.—Recovery of Hemadsorption Viruses from Various Respiratory Disease Syndromes

Illness	No. Tested	Virus Isolation					
		Type 1		Type 2		Total	
		No.	%	No.	%	No.	%
Pneumonia	244	4	1.6	0	...	4	1.6
Croup	31	2	3.7	9	16.7	11	20.4
Bronchiolitis	77	1	1.3	0	...	1	1.3
Pharyngitis*	57	2	3.5	3	5.3	5	8.8
Mild respiratory tract disease							
Febrile	311	7	2.2	19	6.1	26	8.9
Afebrile	103	4	3.7	2	2.8	6	5.6
Undetermined	28	0	0	1	3.6	1	3.6
Total	879	20	2.3	34	3.9	54	6.1

* Including patients with pharyngitis and bronchitis combined or mild pharyngeal component with bronchitis predominating.

Serologic Studies.—The occurrence of hemadsorption virus infection in persons with respiratory disease was confirmed by the serologic studies shown in table 4. Paired serum specimens were available from 19 of the patients with respiratory disease

from whom either type 1 or type 2 virus was recovered. In tests with these serums, the efficiency of the complement-fixation technique in detecting infection appeared to be extremely high. Thus, eight of nine patients from whom type 1 virus was isolated and all 10 persons yielding type 2 virus developed a complement-fixation antibody rise for the appropriate antigen.

In this study, as well as in other unpublished investigations, approximately one-half of persons from whom type 2 virus was isolated also developed a rise in type 1 complement-fixation antibody.⁴ The reverse situation, i. e., a rise in type 2 complement-fixation antibody in patients infected with type 1 virus, has not been observed. Therefore, a serologic diagnosis of type 2 infection was assigned to patients from whom virus was not isolated but who developed a type 2 complement-

TABLE 4.—Serologic Evidence of Infection with Hemadsorption Viruses in Respiratory and Control Groups

Group	No. Tested	Rise in Complement-fixation Antibody									
		Type 1*			Type 2			Total			Virus Isolated %
		No.			No.			No.			
		Virus Isolated %			Virus Isolated %			Virus Isolated %			
		No.	Isolated	%	No.	Isolated	%	No.	Isolated	%	
Respiratory illness											
Pneumonia	156	28	2	17.9	10	0	6.4	38	2	24.4	
Croup	43	5	2	11.6	13	8	30.2	18	10	41.9	
Bronchiolitis	43	5	1	11.6	2	0	4.6	7	1	10.3	
Pharyngitis†	32	5	2	15.6	5	2	15.6	10	4	31.2	
Mild respiratory tract disease	13	4	1	30.8	0	0	0	4	1	30.8	
Total	287	47	8	16.4	30	10	10.4	77	18	26.8	
No respiratory illness‡ ..	124	8	0	6.4	1	0	0.8	9	0	7.3	

* Rise in complement-fixation antibody for type 1 virus only.

† Including patients with pharyngeal component with

‡ Inpatients; this entire c the groups for each of the separate respiratory syndromes (see table 1). However, when the serologic rate of infection (type 1 or type 2) of each of the respiratory groups was compared with that of a suitable age-matched control group, the differences were equal to or greater than those shown.

fixation antibody rise, whether or not this was accompanied by a type 1 complement-fixation antibody rise.

The complement-fixation antibody studies shown in table 4 supplement the virus isolation findings in suggesting an etiological role for the hemadsorption viruses in respiratory illness. Thus, the proportion of patients with respiratory disease who developed a complement-fixation antibody pattern indicative of type 1 virus infection (16.4%) or type 2 virus infection (10.4%) was, respectively, 2.5 and 13 times greater than that observed for the control group.

Patients with pneumonia, croup, bronchiolitis, or pharyngitis developed serologic evidence of type 1 infection approximately two to three times more frequently than the control group. These findings are consistent with the impression gained from the virus isolation data (table 3) that type 1 virus was associated with each of the aforementioned respiratory syndromes.

The highest incidence of antibody rise for type 2 virus occurred with the croup syndrome (30.2%). This finding supports the high rate of virus isolation (16.7%) from these patients. Type 2 complement-fixation antibody rises were significantly more frequent in patients with pneumonia, bronchiolitis, and pharyngitis than in the control group. Type 2 virus was not isolated from patients with pneumonia or bronchiolitis, and the serologic findings constitute the only evidence implicating this agent in these syndromes.

The question of dual infection with other viruses known to cause respiratory illness or suspected of such an association was considered. However, only 16% of patients with serologic evidence of hemadsorption virus infection showed a concomitant complement-fixation antibody rise for the other agents included in our tests, i. e., Asian influenza type A, croup associated, and adenovirus.³

The proportion of the observed respiratory illness associated with the hemadsorption viruses was considerably higher when estimated by the complement-fixation test than by virus isolation. Since

by retrospective serologic study. Preliminary findings indicate that type 1 virus was associated with a large proportion of respiratory illness during the winter of 1956-1957 in Baltimore. Thus, 41% of 113 patients with pneumonia or bronchiolitis developed a complement-fixation antibody rise for type 1 virus. The amount of illness caused by type 1 virus was probably less than the indicated value, since the average interval between paired serum specimens was six weeks.^{5b} In contrast to the findings for type 1 virus, there was no evidence that type 2 infection had occurred.

Virus Dissemination in Various Age Groups and During Different Months.—The influence of age on the isolation of the hemadsorption viruses is shown in table 5. Among infants and children up to 4 years of age who were ill enough to require hospitalization, type 1 or type 2 virus was isolated. The highest rate of recovery was in the 2-to-4-year-old group. In contrast, among the clinic patients, type 1 or type 2 virus was recovered as commonly from the 4-to-10-year-old age groups as from younger patients.

TABLE 5.—Influence of Age on Isolation of Hemadsorption Viruses in Patients with Respiratory Illness

Age, Yr.	Severe Illness*						Minor to Moderate Illness						Total					
	No. of Isolations			No. of Isolations			No. of Isolations			No. of Isolations			No. of Isolations			No. of Isolations		
	No. Tested	Type		Total	No.	%	No. Tested	Type		Total	No.	%	No. Tested	Type		Total	No.	%
		Type 1	Type 2					Type 1	Type 2					Type 1	Type 2			
0-1	178	4	5	9	5.1		104	5	11	16	9.8		342	9	16	25	7.3	
1-2	120	2	3	5	4.2		122	3	5	8	6.6		242	5	8	13	5.4	
2-4	70	3	4	7	8.9		93	1	3	4	4.1		177	4	7	11	6.2	
4-6	35	0	0	0			48	1	3	4	8.3		83	1	3	4	4.8	
6-10	15	0	0	0			12	1	0	1	8.3		27	1	0	1	3.7	
>10	5	0	0	0			3	0	0	0			8	0	0	0		
Total	432	9	12	21	4.9		447	11	22	33	7.4		879	20	34	54	6.1	

* Pneumonia, croup, bronchiolitis, and pharyngitis.

many of the patients were not seen until the third to fifth day of illness, the virus recovery rate of 6.1% probably represents a minimal estimate of the contribution of the hemadsorption viruses to respiratory disease. The estimate available from the serologic studies, when adjusted for the inapparent infections which occurred in the control group, was approximately 19.5% (26.8% minus 7.3%). Since the opportunity for cross infection on the respiratory disease wards and on the control wards was not strictly comparable, this value must be considered as an approximation and probably represents a maximal estimate. The true value probably lies somewhere between the serologic and virus isolation estimates. In view of the short interval between acute and convalescent serum samples (three weeks) and the diagnostic efficiency of the complement-fixation technique, an estimate close to that obtained by serology seems most realistic.

Serologic Evidence of Type 1 Infection During 1956-1957.—The past role of the hemadsorption viruses in illness is currently under investigation

It is of interest that type 1 virus was recovered during six of the eight months of this study (table 6). Similarly, type 2 virus was isolated during seven of the eight months. During March and May, when type 1 virus was not isolated, serologic studies failed to reveal evidence of infection with this agent. November, the month when type 2 virus was not recovered, was also the interval during which the serologic study indicated the lowest rate of infection (3.3%).

It is of some interest that type 1 and type 2 viruses were each introduced into a welfare nursery in the Washington, D. C., area at the time of their greatest prevalence in the general community. The rate of recovery of type 1 virus from the community varied from 1.2 to 7.5%. The highest rate occurred in November, when type 1 virus was responsible for a sharp outbreak of febrile respiratory disease in the welfare nursery.¹ Similarly, an extensive outbreak of type 2 infection started in the same nursery in May, the month when this agent was at its highest level (13%) in the community.⁶

Comment

A previous report suggested the etiological association of type 1 virus with respiratory disease. In an outbreak of febrile disease with upper respiratory symptoms and pneumonitis, which occurred in a welfare nursery, illness was significantly more prevalent among children with type 1 infection.¹ In the present investigation, additional evidence was obtained for the etiological role of type 1 virus in respiratory disease; this agent was recovered almost exclusively from children with respiratory illness.

Volunteer studies have established that type 2 virus can cause mild upper respiratory symptoms in adults, but the present investigation provides the first evidence for the role of this agent in childhood disease.⁷ As in type 1, the type 2 agent was recovered almost exclusively from children with respiratory symptoms.

Both hemadsorption viruses were recovered from children with mild illness, as well as from persons with respiratory disease severe enough to require

for approximately 35% of the patients with respiratory disease admitted to the hospital. It must be emphasized that these findings reflect only the viral experience of a hospitalized indigent population of the Washington, D. C., area during 1957-1958. In other years and in other localities, respiratory illness may be associated with agents not active during the present study.

The largest contribution of the hemadsorption viruses to illness occurred in croup (acute laryngotracheobronchitis), which represents the most acute emergency among the various respiratory syndromes in infancy and childhood. The amount of croup associated with both agents was estimated by serologic studies to be 42%. Thirty per cent of patients with this syndrome developed a complement-fixing antibody rise for type 2 virus and 12% for type 1 virus.

Dissemination of both type 1 and type 2 viruses during most of the fall, winter, and early spring of 1957-1958 was in contrast to the pattern observed in the same population for Asian influenza A. The latter agent had a peak prevalence during October, followed by low activity during November, January, and February, as evidenced by both virus isolation and serologic studies. In unpublished studies, evidence of year-round occurrence of the hemadsorption viruses was obtained.⁸ Type 1 or type 2 virus was isolated during the months of June, July, and August, 1958, thus supplementing the recovery of virus from October, 1957, through May, 1958. The recovery rate for these viruses during the June through August period was 2.3% for both type 1 and type 2.

TABLE 6.—*Recovery of Hemadsorption Viruses During Different Months of Study Period, 1957-1958*

	Respiratory Illness			No Respiratory Illness		
	No. Tested	Recovery, %		No. Tested	Recovery, %	
		Type 1	Type 2		Type 1	Type 2
Oct.	85	1.2	2.4	37	0	0
Nov.	80	7.5	0	29	0	0
Dec.	82	3.7	2.4	38	0	0
Jan.	230	1.7	4.3	281	0	0.4
Feb.	150	2.7	5.3	113	0.9	0
March	101	0	5.0	67	0	0
April	68	2.9	1.5	200	0	0
May	23	0	13.0	94	0	0
Total	870	2.3	3.9	850	0.1	0.1

admission to the hospital. The findings suggest that these agents are capable of causing a wide spectrum of clinical manifestations. The role of other factors, such as concomitant bacterial infection, in determining the severity of illness cannot be assessed at the present time.

Over the eight-month period of October, 1957, to May, 1958, type 1 virus was estimated by serologic studies to be associated with 10% (16% minus the 6.4% observed for the controls) of the patients with respiratory illness who required hospitalization and type 2 virus with 9.6% (10.4% minus the 0.8% observed for the controls). The combined contribution of these agents, 19.5%, exceeded a similar estimate for Asian influenza A, which was 13%. During the month of October, influenza accounted for a large proportion of illness (52%); however, its relative quiescence during the remainder of the study period accounts for the low over-all estimate. When the complement-fixing antibody rises that were attributable to the hemadsorption viruses, influenza A, and adenoviruses (2%) were combined, it was possible to make an etiological diagnosis by serologic means

Summary

In a study involving 1,738 children who were patients in three Washington, D. C., hospitals, types 1 and 2 hemadsorption viruses were recovered almost exclusively from patients with respiratory disease. The results suggest that these agents play an etiological role in respiratory illness. The patients from whom the agents were recovered had illnesses ranging from mild afebrile upper respiratory disease to the syndromes of pneumonia or croup.

The virus recovery rate among patients with respiratory disease was 2.3% for type 1 and 3.9% for type 2. The amount of illness associated with these agents was higher (19.5%) when estimated by the complement-fixation technique. The highest rate of virus recovery (16.7%) or complement-fixing antibody rise (30.2%) occurred for type 2 virus in patients with the croup syndrome.

Addendum

The rate of recovery of hemadsorption viruses from infants and children with respiratory illness from October, 1957, to May, 1958, as reported in this communication, was maintained during a period of additional experience from June through

December, 1958. In the total study (October, 1957, to December, 1958), type 1 hemadsorption virus was isolated from 2.6% (43) of 1,654 patients with respiratory disease and type 2 hemadsorption virus from 3.6% (60). The recovery rate of type 1 virus from 1,381 controls was 0.14% and of type 2 virus 0.22%. Type 2 virus was recovered from 19% (16) of 84 patients with croup and type 1 virus from 2.1% (8) of 378 with pneumonia.

This study was supported, in part, by a grant from the U. S. Public Health Service.

Specimens were made available for study by Dr. Leroy Hoeck, former director of the Pediatric Division, District of Columbia General Hospital, and Dr. Frederick Burke, director of the Department of Pediatrics, Georgetown University Medical Center.

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AIR HYGIENE FOR HOSPITALS

I. ARRESTMENT OF AIRBORNE AND DUSTBORNE STAPHYLOCOCCI BY A HOSPITAL VACUUM CLEANER

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Since hospital dust is a common reservoir of bacteria, molds, and possibly viruses, the importance of dust control in hospital housekeeping is generally accepted.¹ Current interest in the prevention of staphylococcal infection in hospitals has focused attention on methods of cleaning, but there has been no general agreement about the best means of controlling dust and airborne organisms. As is often the case, the number of opinions about the effectiveness of different methods exceeds the number of controlled studies on which such opinions could reasonably be based. The diversity of thought regarding the use of vacuum cleaners is a case in point.

The range of current medical opinion on this subject runs the gamut from acceptance of some types of vacuum cleaners to categorical condemnation of all vacuum cleaners as unfit for use in hospitals. According to Walter,² certain cyclonic and water-trap separators are adequate for hospital use. At the other extreme, the view is widely held that vacuum cleaners merely redistribute organisms passing through them.³ If one may judge from casual conversations, certain physicians are under the impression that vacuum cleaners may disseminate

The desirability of excluding all types of vacuum cleaners from hospitals is disputed. The efficiency of one type of machine was tested by a variety of physical and bacteriological procedures, including the use of freshly generated aerosols of a standard strain of staphylococci. When fresh paper filter cones were used in the machine, penetration by the cocci never exceeded 0.49%, and when dust-coated filter cones were used, apparent arrestment of bacterial droplet nuclei rose to more than 99.99%. The evidence did not justify an indiscriminate condemnation of vacuum cleaners as unfit for use in hospitals. It indicated, rather, that the machine tested was very efficient in many hospital situations when used by well-trained personnel. The observations also suggested various improvements in design (such as disposable containers for dirt) and operation (such as heat sterilization of dust-laden canisters) that should be explored further.

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more organisms than they collect. Since organisms are unable to multiply in the dry state, this would be impossible unless water or some aqueous solution were aspirated into the machine.

In air-cleaning terminology, fine filtration refers to the arrestment of atmospheric dust or of an aerosol of particles averaging 1μ or less in diameter.⁴ Studies of the arrestment of such particles are carried out by the manufacturers of some vacuum cleaners but are seldom publicized. In a recent survey of vacuum cleaners by a consumers' organization, 43 makes of machines were tested for rug-cleaning ability and several other characteristics.⁵ Retention of particles (efficiency of filtration) and freedom from disturbance of floor dust were not among the properties tested. A machine advertised as the "vacuum cleaner that walks by itself" was found to lighten the dead weight of the machine by directing the blast of exhaust air straight downward! However restful this arrangement may be for the weary housewife, no comment is needed on the suitability of cleaners such as this for use in hospitals.

In a study of a cylinder-type cleaner (Hoover, model 402), Rogers⁶ concluded that the bag in this machine acted as a bacterial as well as a dust filter. The bacterial efficiency of the bag increased as dust became entrapped in its meshes. Although these conclusions are in agreement with those to be reported in this paper, the crude method of exposing an open plate in the air stream unfortunately deprives his study of quantitative significance.

Our interest in the subject was stimulated by finding coagulase-positive staphylococci among species recovered from the dust-coated filter cones of the vacuum cleaners in the Massachusetts Eye and Ear Infirmary. Since the same species were also present in air samples taken in the areas where the vacuum cleaners were in use, it seemed important to determine whether these machines were disseminating or collecting organisms present in the air. It was therefore decided to test the retentive efficiency of our machine and also to establish criteria for selection of vacuum cleaners suitable for use in hospitals.

Properties of Vacuum Cleaners

Dry vacuum cleaners are self-contained filter-blower systems which pass air at relatively high velocity through porous mediums such as paper, cloth, or mats of mineral or organic fibers. In such systems, arrestment of particles smaller than the interstices between fibers is largely the result of inertial impaction of particles on fibers,⁷ rather than the result of straining or sieving, which removes particles larger in diameter than the interstices between fibers. In both mechanisms, arrestment of fine particles increases with increasing dust load upon the filter face, although only at the expense

of increasing pressure drop across the filter and of eventual reduction in volume of air passing through the filter.

Properties to be considered in selecting a vacuum cleaner for use in a hospital include essential properties such as cleaning ability and freedom from turbulence, and other desirable properties.

Cleaning Ability.—Clearly, the first requirement of any vacuum cleaner must be its ability to pick up dirt by suction and to remove it from the air passing through its filters. The volume of air so treated must be suited to the requirements of the situation in which the machine is to be used.

Freedom from Turbulence.—Exhaust from the machine should not cause disturbance of floor dust by strong currents traveling at or near floor level. Such currents bring about resuspension of particles deposited by gravitational or random settling.

Quietness of Operation.—Especially in hospitals, the objection to noisy machines and the desirability of quiet operation are self-evident.

Disposability of Waste.—In certain situations, especially in the disposal of radioactive or toxic dusts, the use of a disposable bag or paper liner, which can be removed and discarded without dissemination of particles, is mandatory for the protection of personnel. In hospitals, this feature is also desirable for the prevention of infection.

Other Characteristics.—Such factors as cost (initial, operating, and maintenance), dependability, portability, adaptability, and other less essential features are to be considered only after the above requirements have been satisfied.

Most of the requirements are met by built-in vacuum ducts provided at the time of construction of a building. For hospitals lacking such central facilities, attention to the properties listed above is recommended.

Apparatus and Materials

The choice of the unit tested in the present study and referred to hereafter as "the machine" was based on (1) favorable experiences with it in the hospital from which this study is reported, where it is used exclusively throughout the wards and floors, and (2) possession by it of the properties of freedom from disturbance of floor dust (air is exhausted horizontally from the top of the machine in a circular pattern 11 in. above the floor) and quietness of operation (this unit was the quietest of all machines tested in the consumers' study referred to above).

The lack of a disposable container (dirt is collected in a metal canister beneath a disposable paper filter cone) is considered a disadvantage less serious than the production of turbulence at floor level.

The Machine.—The vacuum cleaner (Filter Queen, model 500) used in our hospital is of the canister type. According to data provided by the manufacturer, it is capable of passing 45 to 55 cu. ft.

of air per minute when it is operated at 105 to 115 volts. At 120 volts it is said to move approximately 60 cu. ft. of air per minute with all filters in place.

Air entering the canister is directed in a circular path around the vertical inside face of the canister wall. It first encounters the under side of the primary filter, an inverted, disposable paper cone of pure hemp stock approximately 0.006 in. in thickness with a filtering area of 1.0 sq. ft. Tests reported by the manufacturer indicate that its efficiency when unused is very high for particles as small as 3μ in diameter. As it accumulates a coating of dust its efficiency increases and progressively smaller particles are arrested by it. Since gross particles fall to the bottom of the canister, volume output remains high until the canister is tightly packed with dirt.

The secondary filter, a disk of thread-reinforced paper, is interposed between the primary filter and the motor to protect the latter against gross grit in case the machine is operated without the primary filter. The arrestment property of the secondary filter for fine particles is low.

The tertiary filter and silencer is a bat made from wood pulp treated with a bonding material around its outer surface. This filter forms a ring within the circumference of the circular dome of the machine, and air, after passing through it, is exhausted through a number of vents in the side of the dome. The manufacturer reports that this filter retains 70% of dioctyl phthalate smoke (a standard aerosol of particles uniformly 0.3μ in diameter) and almost 100% of particles 1μ in diameter. These figures are all subject to qualification by statement of the relative humidity existing at the time of the tests and also of the nature of the particles encountering the filters.

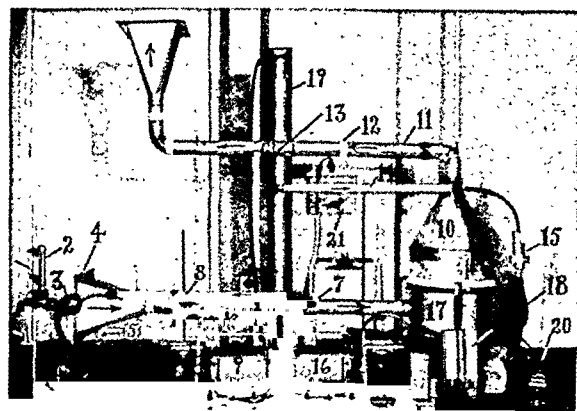
The machines used in this study were obtained from two sources. New units were submitted by the manufacturer for testing. Cleaners in regular use were taken from the floors of the hospital for testing with their accumulated dust load.

Duct-Work.—A round, galvanized, sheet metal downspout, 2 in. inside diameter, was fitted with bayonet adapters for attachment to the intake and exhaust connections of the machine and to a truncated cone-cylinder of sheet metal which fitted over the top of the machine in such a way as to collect all the air emerging from the ports in the side of the dome after passage through the third filter and silencer. (The ducts and collecting funnels were made by the manufacturer to our specifications [see figure].) The ducts were equipped with dispersion disks of the Stairmand[®] type to create turbulence at the sampling points. A mechanical device, designed to straighten a spiraling column of air, was incorporated in the duct downstream from the machine and 6 in. upstream from the downstream dispersion disk. All joints were made as nearly airtight as possible with suitable gasketing.

Air Samplers.—Identical Millipore filter (MF) holders equipped with calibrated limiting orifices were used to hold 0.047-mm. cellulose ester gel membranes (MF) of either the aerosol assay or the hydrosol assay types. Retention of airborne bacteria by membranes of normal pore diameter 0.45μ is essentially 100%.⁹ Maximum flow rates across these membranes are well in excess of the sampling rates used.

Sampling Pumps.—Identical vacuum pumps, capacity 1.3 cu. ft. per minute, were attached by vacuum rubber tubing to the filter holders. The pumps were adjusted to operate at capacity and to draw a vacuum of 24 in. Hg.

Sampling Points.—Right-angle glass tubes of diameters suited to the sampling flow rates were inserted into the ducts, pointing upstream in the center of the ducts and tightly fitted to the openings into the duct wall. The filter holders were connected to the sampling tubes by flexible plastic tubing (Tygon) and rubber tubing in such a way as



Apparatus for test runs: 1, nitrogen supply line; 2, flow regulator; 3, Millipore filter holder; 4, glass fiber medium; 5, nebulizer; 6, location of upstream dispersion disk; 7, upstream sampling point; 8, humidifying column; 9, upstream sampling pump; 10, collecting funnel; 11, location of flow straightener; 12, location of downstream dispersion disk; 13, downstream sampling point; 14, humidifying column; 15, Millipore filter holder; 16, downstream sampling pump; 17, canister of machine; 18, wet-and-dry-bulb thermometers; 19, mercury manometer; 20, Variac transformer.

to insure an airtight seal. The sampling points were placed at the prescribed distance (three to six duct diameters) downstream from the dispersion disks and were located 14 in. upstream and 20 in. downstream from the unit itself. The upstream sampling point was 21 in. from the intake.

Cultures and Bacteria-Bearing Dust.—The Food and Drug Administration strain 209 of *Staphylococcus pyogenes* var. *aureus* (American Type Culture Collection 6538) was used for all freshly generated aerosols. Ten-to-16-hour broth cultures were diluted 1:100 with sterile distilled water for atomization. Cultures and stock dilutions could be maintained

for many days at 4 C (39.2 F) without apparent change in titer. Fresh cultures and fresh dilutions were made at frequent intervals.

Dry aerosols were produced by aspiration of dust from stuffed toy animals, obtained from the children's ward, through an ordinary vacuum cleaner hose attached to the intake of the duct system. The dust aerosols were rich in bacteria and molds of many species.

Atomization Equipment.—DeVilbiss 40 atomizers were activated by pure nitrogen from commercial cylinders. Flow rates were measured and regulated by a Hoke flowmeter, capacity 9 liters per minute.

Control of Variables

Sampling.—Sampling volumes were either 10 liters or 26.3 liters per minute, being controlled by calibrated orifices in the MF filter holders downstream from the filter membranes. In all filterless runs and in some test runs, identical sampling rates were used at the upstream and downstream sampling points. In others, 10 liters per minute were sampled at the upstream point and 26.3 liters per minute at the downstream sampling point. Sampling velocities were kept approximately isokinetic with maximum duct velocities.

In a representative number of runs, but not in all runs, the air drawn from the ducts was humidified by passing it through glass tubing, 18 in. long and 1 in. in outside diameter, lined with several layers of rolled, moistened filter paper (Whatman 1), located in series upstream from the MF holders.

Temperature and Relative Humidity.—Room air taken into the system varied in temperature from 74 to 80 F (23.3 to 26.7 C). Its relative humidity varied from 49 to 67%.

Exhaust air from the machine varied in temperature from 103 to 126 F (39.4 to 52.2 C), depending on the filters in the machine and the dust load on the primary filter cone. The relative humidity of the exhaust air varied from 19 to 12%, depending on the degree of warming involved.

Sterility Controls.—Test organisms were not recovered from the downstream duct except when they were being introduced at the intake. There was, therefore, no need to sterilize the unit and ducts. Molecular filter membranes were sterilized by autoclaving for most of the tests and control runs. Failure to sterilize them appeared to make no difference in results obtained, since the test organisms were not present on the filter membranes or in the environmental air.

Velocity and Flow Rates.—Air flow rates through the machine and duct system at given voltages were provided by the manufacturer. The unit was operated at line voltage (115-117 volts A. C.) in all test runs (output approximately 55 cu. ft. per minute). The line voltage was recorded continuously over a three-day period during which tests were being conducted. There was no evidence in

any of the tests or control runs to suggest that variation in flow rates or velocities, within the limits of normal operation, were in any way critical in their bearing on the efficiency of filtration.

Average linear velocities in the duct system were calculated on the basis of flow rates. Maximum duct velocities were measured directly with a Hastings, model G, Air-Meter.

Air Contaminants.—Although the environmental air was relatively free from contaminants, occasional saprophytes appeared on the MF membranes. These usually grew more slowly than the test organisms and appeared to have no effect on the results of test runs. Nevertheless, in a representative series of runs the intake air was filtered through a deep-bed glass fiber medium (Aerosolve 95) of known high efficiency against airborne bacteria. There was no difference between the results of these tests and those in which the intake air was not filtered.

Filterless Runs.—In order to determine the expected recovery rate at the downstream sampling point, about two dozen runs were made with the primary and secondary filters removed and the tertiary filter bypassed. Recovery rates of 92 to 58% were noted, depending somewhat on the temperature of the exhaust air. These filterless runs were made at least once with every series of test runs. When the sampled air was humidified before passage through the MF filters, recovery in filterless runs increased to 93%, without any apparent change in the results of test runs.

Method

With the unit operating at full output, fresh bacterial aerosols were generated at the intake by atomization at the rate of 4 to 6.4 liters of nitrogen per minute, or, alternatively, dry aerosols were produced in the manner described. The input was allowed to flow for one to five minutes before sampling was begun.

The samplers were turned on simultaneously and operated for the desired period, usually 60 seconds by the clock. They were then turned off, and the filter membranes were removed and immediately transferred to the surface of trypticase soy agar in a 90 mm. petri dish. Both the upstream and the downstream membranes of a single run could be accommodated on a single plate with negligible overlap in the center.

Plates were incubated for 24 hours at 37 C (98.6 F) and kept at 25 C (77 F) for an additional 24 hours. Colonies were then counted under suitable magnification, using the ophthalmic biomicroscope and slit lamp. In many of the test runs it was possible to count all the colonies on the downstream membrane. Total counts on upstream membranes were estimated from counts of a sufficient number of grid-marked squares.

The use of magnification permitted essentially 100% accuracy in counting up to 1,000 colonies per MF filter, very high accuracy (plus or minus 5%) in counting up to 10,000 per MF filter, and a fair approximation in counting up to 20,000 colonies.

TABLE 1.—*Typical Arrestment of Nebulized Staphylococci by Machine with New Filters*

Run*	Filters	Colonies/Cu. Ft.		Arrestment, %
		Upstream	Downstream	
S-3.....	None	246	225	...
S-4.....	All	202	1	99.51
S-5.....	All	730	1	99.86
S-6.....	All	1,860	7	99.60
S-7.....	Auxiliary†	1,350	65	95.18
S-8.....	Auxiliary	1,260	63	95.79
S-9.....	Tertiary	1,120	25	97.77
S-10.....	Tertiary	1,000	28	97.20
S-11.....	Primary	1,140	152	86.15
S-12.....	Primary	1,180	143	87.97

* Representative series of consecutive runs.

† An experimental filter, not part of the standard machine.

When only a few colonies were present, as was often the case on downstream membranes, they grew so large that no magnification was necessary.

Results

Fresh Moist Aerosols.—Suspensions of *Staph. pyogenes* var. *aureus* nebulized into the system at the intake showed consistently a very low degree of penetration of the filters in the machine. When new, unused paper cones (primary filters) were used, this averaged 0.31% in a large series of runs. In no instance was the penetration greater than 0.49%. The results were apparently unaffected by minor variation in rates and velocities of sampling. When dust-coated filter cones were used, apparent arrestment of bacterial droplet nuclei rose to more than 99.99%. The results are shown in tables 1, 2, and 3.

Old Dry Aerosols.—When dry, dustborne organisms were aspirated into the system, spreading growth of molds and high concentrations of contaminated particles at the outside edges of the upstream sampling membranes made enumeration of colonies impossible. Since the downstream membranes were almost entirely free of colonies, in-

TABLE 2.—*Average Arrestment of Nebulized Staphylococci by Machine with New Filters*

Runs, Av. No.	Filters	Arrestment, Deviation,	
		%	%
11.....	All	99.69	±0.18
4.....	Tertiary alone	97.52	±0.25
3.....	Primary alone	86.00	±2.00
3.....	Secondary alone	46.00	±4.00

bility to determine the exact number of colonies recovered at the upstream sampling point made little difference in the results (table 4).

Output of Organisms by Loaded Machine.—When the machine was operated while carrying a generous load of dirt in the canister and a heavy felt of dust on the primary filter, samples of the exhaust air

showed no organisms in 4.65 cu. ft. of air sampled over a five-minute period. This result was repeatedly confirmed in shorter runs.

Creation of Turbulence.—No appreciable turbulence of air around the machine could be detected at floor level with cigarette or titanium tetrachloride smoke. At 12 in. above floor level, the exhaust from the switch port would blow out a paper match held

TABLE 3.—*Average Arrestment of Nebulized Staphylococci by Machine with Dust-Coated Filter Cones*

Runs, Av. No.	Filters	Colonies/Cu. Ft.		Arrestment, %
		Upstream	Downstream	
7.....	All	7,937	0.71	99.99+
2*.....	Primary	7,415	1.5	99.98+
2*.....	None	6,225	5,800	...

* Humidified sampling; four consecutive runs.

2 ft. away. At other points around the periphery, a match held 11 to 13 in. above floor level (but no higher nor lower) was blown out at distances from 9 to 14 in. from the side of the dome but not at greater distances.

Operational Performance.—As previously noted, quietness of operation is a feature of this machine. Units in daily use on the wards for periods up to nine years have been dependable and have required a minimum of maintenance. The negative pressure developed by the machine (60-75 in. H_2O), together with the volume of air moved by it, have been adequate for cleaning rugs, pillows, and mattresses as well as bare floors.

Comment

The main part of the study, and the part having the greatest statistical significance, was the quantitative sampling of nebulized staphylococcic aerosols. Certain questions remain to be answered regarding these experiments. The first has to do with the fate of droplets issuing from the nebulizer before they encountered the filter face. The second relates to the size and state of dispersion of bacterial particles remaining after evaporation of the droplets. The third question is concerned with the rates of recovery observed in filterless runs.

TABLE 4.—*Typical Arrestment of Dustborne Bacteria* by Machine with New Filters*

Run	Filters	Colonies/Cu. Ft.	
		Upstream	Downstream
S-13.....	All	Heavy growth	0
S-14.....	All	Heavy growth	0
S-15.....	All	Heavy growth	1
S-16.....	None	Heavy growth	Heavy growth

* Aspirated from stuffed toy animals.

In regard to the first question, droplets formed by a DeVilbiss 40 nebulizer operated at 6.4 liters per minute have an apparent diameter of 13μ .¹¹ Water droplets of this size evaporate in 0.02 seconds in still air of relative humidity 50% at 22 C.¹² In moving air their evaporation time would presumably

be shorter. Calculation of the time required for droplets to travel the distance from the intake to the filter face shows that this interval was the same as or longer than the time required for evaporation of droplets to occur in still air at the same temperature and humidity. Doubling this interval by adding an extension to the intake had no effect on the arrestment observed.

According to Kethley, Cown, and Fincher,¹¹ the majority of particles produced by atomization of suspensions of *Serratia marcescens* under conditions similar to those prevailing in these experiments contained a single bacterial cell. Although we used no prechamber to screen out larger particles, observation of organisms stained on sampling filter membranes with the ordinary light microscope and of unstained organisms with the phase contrast microscope indicated that the typical particle recovered from the air stream consisted of a single bacterium of approximately 0.4 to 0.7 μ diameter. We were impressed by the small size of these staphylococci in smears in comparing them with other cocci observed in routine clinical cultures. It was our impression that these organisms were as small as the smallest bacterial particles likely to occur as droplet nuclei in the natural state.

Two factors were believed to be responsible for the variation in recovery rates observed during filterless runs. Spontaneous death from desiccation presumably accounted for slight losses which must have been in proportion to warming of the air during its passage through the system. According to the results of Ferry,¹² in observations with nonpathogenic staphylococci, these losses must have been insignificant during the short time interval involved.

It is well known that considerable loss of viability of organisms isolated from air can occur after their arrival on a filter surface.⁷ Goetz⁹ found that for *Staph. pyogenes* var. *aureus*, an organism rather insensitive to atmospheric conditions, the recovery of cells theoretically contacting the MF surface varied between 50% and 100% at flow rates bracketing those used in our study. Recovery was not affected within these limits by variation of flow rates nor of the relative humidity. Since our recovery rates parallel those of Goetz rather closely, it seems reasonable to attribute the variation observed to the factor of viability loss on the MF surface.

By the same token, it is possible that the results observed in test runs represent not only mechanical arrestment of particles but a combination of this with biological inactivation of viable particles on the filters of the vacuum cleaner. However, the recovery of many viable forms from the dust on the filter cones showed that arrestment alone could account for retention of dustborne bacteria at least.

Although the efficiency of the dust-loaded machine against airborne bacteria appears almost unbelievably high, analysis of the combined perform-

ances of new primary and tertiary filters operated singly shows a close correspondence with the arrestment observed with both filters operating together in their normal combination. Thus, it will be noted that penetration of the new primary filters averaged 14% and that of the tertiary filters, 2.5%. Multiplication of these factors gives a figure of 0.35%, which falls within the range observed for penetration of the intact machine with a new primary filter in place. The sharp increase in efficiency of the primary filter, with accumulation of a dust coating on its undersurface, to values approaching 100% arrestment, when combined with the 97.5% efficiency of the tertiary filter, could easily account for a number of sterile membranes at the downstream sampling point and for the extremely low penetration observed in test runs of the dust-loaded machine. It will be clear from inspection of these results that a 50% variation in viability after sampling would make little difference in the significance of the results obtained.

Summary and Conclusions

The evidence presented in our study fails to justify categorical condemnation of vacuum cleaners as unfit for use in hospitals. The results indicate the efficiency of one machine against bacterial aerosols consisting of suspended droplet nuclei or dustborne organisms. Extension of similar techniques to the investigation of other brands might demonstrate that their effectiveness has likewise been underestimated.

Its arrestment of bacteria, its freedom from disturbance of floor dust, and its quietness of operation permit a qualified endorsement of the vacuum cleaner tested in this study (Filter Queen, model 500) for use in hospitals. Its only drawback is lack of a fully disposable container for collected dirt. This lack can be largely offset by careful handling of dust-coated filters and by selection of a space removed from patients' quarters for emptying the canister and changing the primary filter cones. In our hospital, cleaning personnel bring their vacuum cleaners to the basement every other morning for emptying while they pick up supplies. The canisters are emptied by a trained man into a common bag which is then incinerated. At the same time the machines are checked, serviced as needed, and equipped with new filter cones for the next two days' use.

Special precautions should be adopted in tuberculosis sanatoriums and other infectious disease units for the protection of personnel charged with the responsibility of emptying the canisters. If necessary, heat sterilization of the canister with its dust load could be performed before final disposal of the latter is undertaken.

The vacuum cleaner used in our hospital was found to combine efficient arrestment of viable air-

borne and dust-borne bacteria with quietness of operation and freedom from disturbance of floor dust.

200 Beacon St. (16).

Melvin W. First, Sc.D., gave advice during this study. Mr. Werner Mueller Jr. made parts of the mechanical equipment.

This study was supported in part by the Massachusetts Eye and Ear Infirmary through its Bacteriology Research Fund.

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NEONATAL INFECTIONS IN A COMMUNITY HOSPITAL

REPORT OF TWO OUTBREAKS

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The purpose of this paper is to record the problems and experience encountered in two outbreaks of neonatal infections in a community hospital. It includes the sequence of events leading up to and including the outbreaks, the investigations undertaken, measures instituted to control the outbreaks, and clinical observations that were made.

The outbreaks occurred in the Baton Rouge (La.) General Hospital, a community hospital with approximately 300 beds. The nursery occupied a total area of 727 sq. ft. There has been a steady increase in the number of yearly deliveries: in 1951, there were 1,844 deliveries; in 1952, 1,952; in 1953, 2,350; in 1954, 2,448; in 1955, 2,435; in 1956, 2,712; and in 1957, 3,093.

The 1956 Outbreak

Clinical Observations.—In October, 1956, because of construction work in the nursery, for a period of about 10 days a temporary nursery was es-

Two outbreaks of neonatal infection in a nursery are described. The first involved 4 children and was fatal to 3; the second, a year later, involved 26 children and was fatal to 9. No one organism could be held responsible, but in the first outbreak *Listeria monocytogenes* predominated, and in the second the organisms found were mainly group A streptococci. The experience emphasized the danger of overcrowding in nurseries, the importance of due attention to the umbilicus as a likely portal of entry for neonatal infections, and the need generally of enforcing rigid aseptic techniques.

tablished in three postpartal rooms with a total area of 540 sq. ft. The nursery census at the time, unfortunately, was relatively high (fig. 1), which led to further overcrowding.

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Case Data for Thirty Infants with Hospital Neonatal Infections (continued)

Case No.	Sex	Date of Birth	No. of Days After Birth to			Signs and Symptoms	Course of Disease	Laboratory Data
			Discharge from Nursery	Onset of Symptoms	Readmission			
20	M	12/ 8/57	5	11	Out-patient	Fever; irritability; umbilical erythema	Recovered in 4 days	...
21	M	12/ 8/57	5	11	Out-patient	Fever; irritability; umbilical erythema	Recovered in 4 days	...
22	M	12/ 8/57	(Transferred to nursery for premature at another hospital)	4 (While in nursery for premature)	...	Fever 38.3 C (101 F); listless; anorexia; vomiting; jaundice	Afebrile in 12 hr.; well in 5 days	WBC, 7,500/cu. mm.; blood culture: negative; blood: potassium, 4 mEq./liter, serum phosphorus, 8.3 mg. % bilirubin, 15 mg. %
23	F	12/ 9/57	4	10	Out-patient	Fever; irritability; umbilical erythema	Well in 4 days	...
24	F	12/10/57	3	7	4	Irritability; cyanosis; diarrhea; induration about umbilicus	Died 12/19/57 Autopsy: purulent umbilical vein to liver with streptococci demonstrated in pus; flabby, pale heart; endocardial thrombi; focal necrosis in liver	WBC, 32,000/cu. mm.; blood culture: beta hemolytic streptococcus group A
25	M	12/11/57	3	10	Out-patient	Fever 38.3 C (101 F); diarrhea; vomiting; umbilical irritation; pustules in diaper area	Well in 5 days	WBC, 18,300/cu. mm.
26	F	12/14/57	3	23	Out-patient	Dactylitis; umbilical erythema	Well in 5 days	Blood culture: negative; culture of umbilicus, enterococcus
27	F	12/14/57	4	7	Out-patient	Umbilical secretions; irritability; listless; abdominal pustules	Well in 3 days	Blood culture: coagulase-positive Staph. aureus
28	M	12/15/57	6	11	Out-patient	Fever 38.8 C (102 F); irritability; umbilical secretions	Apparently well in 2 days; returned at 26 days of age with fever; appeared to respond but died 30 days of age	WBC, 8,250/cu. mm.; blood culture: negative; blood: potassium 8 mEq./liter 1/11/58
29	M	12/17/57	3	4	4	Listless; anorexia	Autopsy: large, flabby heart with myocardial petechiae Died 2 hr. after admission	...
30	M	12/17/57	4	4	4	Listless; cyanotic; mild jaundice	Autopsy: dilated, flabby heart; aspirated amniotic material Died ½ hr. after admission Autopsy: dilated, flabby heart; partly healed and edematous navel	WBC, 8,500/cu. mm.; blood culture: negative 12/20/57

Laboratory Data: An elevated white blood cell count (more than 12,000 per cubic millimeter) was present in 11 of the 17 patients for whom it was measured. Hyperkalemia (serum potassium level more than 6.4 mEq. per liter) was noted in four of the seven patients for whom this level was obtained. All four patients with conspicuous hyperkalemia were in the critically ill group.

Response to Therapy: Patients were treated with various combinations of antibiotics (including penicillin, streptomycin, chloramphenicol, and erythromycin) after ordinary tests for bacterial sensitivity were done. In addition, some infants were given, more or less on an empirical basis, sulfonamides, steroids, and supportive therapy with digitalis, blood transfusion, and gamma globulin. No one regimen appeared to be uniformly successful. Infants with skin lesions tended to recover rapidly with penicillin therapy alone, while some patients died despite intensive antibiotic therapy and after follow-up blood cultures had been sterile. Two infants (see table, cases 19 and 28) died after an apparently good initial response to therapy but with a sudden recrudescence of fever followed by circulatory collapse; the asymptomatic interval was as long as 14 days in one of them.

With the hope of preventing further seeding of the blood stream, ligations of the umbilical vein close to the liver were performed in two critically ill infants. This procedure, however, did not seem to be of any real benefit.

After the recognition of a sharp increase in infections, prophylaxis with either chloramphenicol or erythromycin was given to all nursery contacts with or without symptoms starting on Dec. 19, 1957. Despite this, two infants died suddenly two and one-half days after institution of therapy with large doses of chloramphenicol. They had no unusual symptoms until a few hours before death.

Pathological Observations.—Eight of nine infants who died in the 1957-1958 outbreak were examined post mortem. It was noted most consistently that in seven of these eight there was conspicuous dilatation of both right and left sides of the heart, with soft and flabby myocardia in many instances accompanied by petechial hemorrhages. In the patient in case 12 there was an actual myocarditis in association with focal vasculitis which was part of a generalized picture resembling periarteritis nodosa in older subjects (fig. 2). The infant in case 24 had small endocardial thrombi between the papillary bundles and that in case 19 a slight chronic peri-

carditis. In the remaining five cases there was no evidence of gross or microscopic myocardial changes. In addition to a flabby heart in the patient in case 29, there was evidence of aspirated amniotic

TABLE 2.—Clinical Manifestations and Symptoms in Twenty-six Infants During Outbreak of Hospital Neonatal Infections

	Cases, No.
Male infants	16
Premature infants	2
Symptoms	
Fever (>37.7 C [99.8 F])	19
"Change" in infant (anorexia, listlessness, irritability)	17
Omphalitis (periumbilical erythema, moist or indurated umbilicus)	17
Skin lesions (erysipelas, pustules, cellulitis, or petechiae)	12
Respiratory signs (cyanosis or dyspnea)	7
Cardiac failure	7
Neurological signs (full fontanelle or convulsions)	4
Jaundice	2

contents; the infant in case 24 also had multiple areas of acute focal hepatic necrosis with early sup-puration.

Of the seven patients in whom the brain was ex- amined, four (cases 5, 8, 12, and 19) showed evi- dence of hemorrhage within the substance of the brain. In two (cases 5 and 8) there was also super- imposed meningitis.

At the time of autopsy, four infants had no gross evidence of umbilical infection, whereas the other four had evidences of residual inflammation. The ligamentum teres was sectioned and examined in six; in all but one (case 29) inflammatory changes were found. These changes varied from minimal to massive suppuration which was found to contain streptococci on direct smears (fig. 3). In summary,



Fig. 2 (case 12).—Focal vasculitis found at autopsy.

six of eight infants presented either gross or micro- scopic evidences of umbilical infection in or about the umbilical vein. Thus, there seems little doubt that this structure was a likely or common portal of entry for the lethal infection.

Investigation of 1957 Outbreak

In view of the developing epidemic situation, delivery services were closed on Dec. 19, 1957, and the 36 babies remaining in the nursery were trans- ferred to their mothers' rooms until discharge. In- vestigations were instituted by the hospital admin- istration and medical staff. On Dec. 22, aid was requested from Dr. John Bruce, epidemiologist, the Louisiana State Department of Health, and from the U. S. Public Health Service.

Nursery Procedures.—Masks and gowns were worn by all personnel. On admission, infants were bathed with water to remove the vernix; sometimes oil was used if the vernix was particularly adherent. Thereafter, the infant was sponged daily with sterile water and wiped with oil if it was felt necessary. Nothing was applied to the cord except a 70% alco- hol solution. If the cord appeared to be separating, it was covered with sterile gauze. After the cord separated the umbilical area was sometimes



Fig. 3 (case 24).—Section of ligamentum teres with sup- puration of umbilical vein.

swabbed with thimerosal (Merthiolate) and covered with sterile gauze. Circumcisions were per- formed in an adjacent delivery room.

Bacteriology.—Group A streptococci were the pre- dominant organisms among infected infants during the explosive phase of the outbreak. However, ba- bies were not infected by a common organism, for cultures from various sources yielded several differ- ent organisms over a four-month period. These in- cluded group A beta hemolytic streptococci, group D streptococci, hemolytic coagulase-positive staphy- lococci, pneumococci, and *Proteus* species.

When the obstetrics services were closed, 10 navel cultures were taken from asymptomatic in- fants still in the nursery. One of these yielded group D alpha streptococci, one group D beta streptococci, and one coagulase-positive staphylococci. Throat cultures were taken from all personnel of the nurs- ery, postpartal floor, and delivery room. In the 60

On Oct. 24, 1956, a female infant (see table, case 1) was born and admitted to the temporary nursery. From birth the infant had respiratory difficulty, cyanosis, and a poor sucking reflex. She died in the nursery on Oct. 28, 1956, after several mild convulsions. The white blood cell count was 59,000 per cubic millimeter. Postmortem blood culture yielded organisms that first were interpreted as diphtheroids but that subsequently were identified as *Listeria monocytogenes*.

After the death of this baby, two infants born on Oct. 21, 1956, and discharged from the nursery on Oct. 25, 1956, and Oct. 26, 1956 (table 1, cases 2 and 3, respectively) were readmitted to the hospital, where they died. The onset of their symptoms were 10 and 11 days after birth, with deaths on the 14th and 16th days respectively. Both infants were

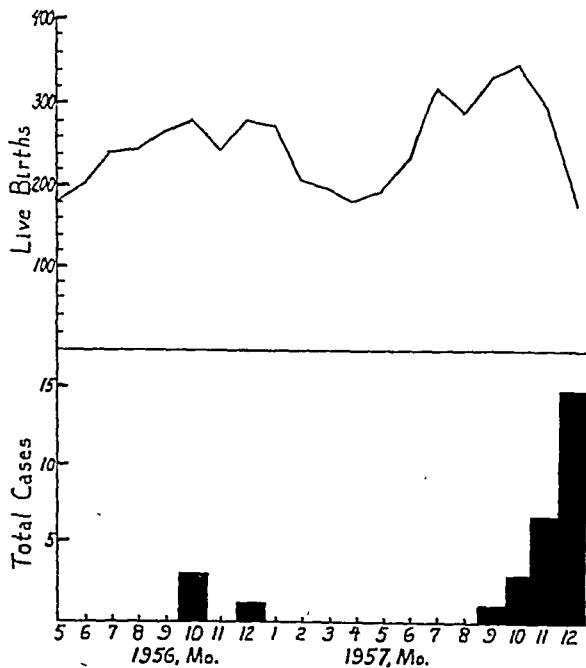


Fig. 1.—Distribution of live births and cases of neonatal infection by month of birth.

apathetic, with fever and cyanosis. The child in case 2 also developed jaundice and petechiae, with some induration of the umbilicus. That in case 3 developed convulsions prior to death. Beta hemolytic streptococci were isolated from the blood of the infant in case 2 and *L. monocytogenes* from purulent spinal fluid of that in case 3.

After transfer of infants back to the permanent nursery there were no further neonatal infections until December. The baby in case 4 (see table), born Dec. 10, 1956, was readmitted at 12 days of age because of fever, apathy, anorexia, and cyanosis. *L. monocytogenes* was recovered from purulent spinal fluid. This infant responded well to mixed antibacterial therapy and recovered without apparent sequelae.

Pathological Observations.—Autopsies were performed on all three infants who died. On gross examination there was an infected umbilicus in two (cases 2 and 3), while in the other infant (case 1) this area appeared normal. In the infant in case 1 there were congenital varicosities on the mitral and tricuspid valves with a superimposed acute valvulitis; there was also acute pneumonitis with septic emboli, focal hepatic necroses, and small adrenal abscesses from which *L. monocytogenes* was recovered. The baby in case 2 showed a fibrinous peritonitis. In the patient in case 3 acute meningitis was the only significant finding.

1957 Outbreak

After the 1956 outbreak, a nursery liaison committee was established and specific recommendations made regarding any further expansion of nursery facilities and use of personnel. Until September, 1957, there were no unusual neonatal infections and no deaths due to neonatal infection were reported. In October and November, several infants developed neonatal infections, culminating in another explosive situation in December (fig. 1).

Clinical Observations.—The only patients considered to have neonatal infections in this outbreak had onset of symptoms within 30 days of birth. In addition, they had either positive findings on blood or spinal fluid cultures or a minimum of two of the signs or symptoms listed in table 2 without obvious congenital anomalies to account for these findings.

Symptomatology. The most common sign was fever (rectal temperature over 37.7 C [99.8 F]). Another frequent finding was a notable "change" in the infant, i. e., apathy, anorexia, or irritability. Evidence of omphalitis was found in several infants. Clinical signs of an unhealthy umbilicus, although not often striking, were present in every instance in which postmortem examination revealed evidence of inflammation of the umbilical vein. Jaundice was not a frequent finding, and in both instances where recorded it was only mild. Cardiac failure, clinically apparent by tachycardia, cyanosis, or hepatic enlargement, occurred in most of the critically ill patients.

Incubation Period. There seemed to be some correlation between prognosis and age of the infant at onset of symptoms. The average interval from birth was 11.4 days, but those infants dying (9) or surviving but considered clinically to be critically ill (3) had shorter incubation periods (7.6 and 9 days respectively). Infants in whom skin lesions were prominent generally had longer (16.4 days) than average incubation periods and a more favorable outcome. Infants who were not critically ill had an average incubation period of 14.6 days.

Case Data for Thirty Infants with Hospital Neonatal Infections

Case No.	Sex	Date of Birth	No. of Days After Birth to			Signs and Symptoms	Course of Disease	Laboratory Data
			Discharge from Nursery	Onset of Symptoms	Readmission			
1	F	10/24/56	...	...	...	Cyanosis at birth	Premature, unable to suck, convulsions; died 10/28/56	WBC, 59,000/cu. mm.
							Autopsy: congenital varicosities in mitral and tricuspid valves with acute valvulitis and leukocyte vegetations; adrenal abscess with <i>L. monocytogenes</i>	
2	M	10/24/56	4	11	13	Fever, diarrhea, petechiae, jaundice; subcutaneous lumps on back and feet	Died 11/4/56	WBC, 9,900/cu. mm.; blood culture: beta hemolytic streptococcus
							Autopsy: acute inflammation of umbilical vein and artery with necrosis; acute peritonitis	
3	M	10/21/56	5	12	12	Fever 38.8 C (102 F); feeding poorly	Died 11/6/56	WBC, 17,600/cu. mm.; CSF: WBC, 8,550/cu. mm., with 71% polymorphonuclear cells; <i>L. monocytogenes</i> on umbilical blood and CSF cultures
							Autopsy: navel and circumcision area infected; umbilical vein thrombosed, not infected; fibrinous meningitis	
4	F	12/10/56	3	11	12	Fever 40 C (104 F); irritable; refused to eat	Recovered slowly; discharged 1/7/57	WBC, 26,000/cu. mm.; CSF: WBC, 3,150/cu. mm., with 95% polymorphonuclear cells; <i>L. monocytogenes</i> on culture
5	F	9/17/57	3	4	4	Fever 39.4 C (103 F); grunting respiration; bulging fontanelle; mild jaundice	Died 9/22/57	CSF: WBC, 41,000/cu. mm.; with 99% polymorphonuclear cells; <i>Proteus</i> species on culture
							Autopsy: <i>Proteus</i> meningitis; bilateral brain abscess; dilated, flabby heart	
6	F	10/4/57	3	25	26	Fever 40 C (104 F); excoriation about umbilicus; erysipelas over buttock and perineum	Afebrile in 36 hr.; discharged 11/4/57	WBC, 18,200/cu. mm.; blood culture: negative after antibiotic therapy
7	F	10/27/57	5	21	21	Fever 39.4 C (103 F); hyperirritability; abdominal distention; navel not completely healed	Afebrile in 12 hr.; discharged 11/22/57	WBC, 34,000/cu. mm.; blood culture: group D streptococci and coagulase-positive <i>Staph. aureus</i>
8	F	10/29/57	6	13	14	Anorexia; blood on navel; opisthotonus; abdominal distention; bulging fontanelle	Died 11/13/57	WBC, 26,000/cu. mm.; blood and CSF culture: ...
							Autopsy: diffuse meningitis; subdural hematoma; pus in umbilical vein to liver; myocardial petechiae	
9	M	11/5/57	6	16	Out-patient	Fever 38.8 C (102 F); omphalitis and cellulitis of navel and penis; dactylitis	Recovered in 1 wk.	...
10	M	11/16/57	0 (Transferred to nursery for premature at another hospital)	7 (While in nursery for premature)	...	Fever; cellulitis of feet; petechiae	Recovered after stormy course	WBC, 64,000/cu. mm.; blood culture: <i>Str. faecalis</i>
11	M	11/18/57	2	11	12	Fever 38.8 C (102 F); erysipelas thigh; cord cauterized on 11/25/57	Afebrile in 24 hr.; discharged 12/4/57	WBC, 41,000/cu. mm.
12	F	11/20/57	3	13	18	Fever; anorexia and vomiting; abdominal distention (umbilical cellulitis); convulsions	Edema; heart murmur; GI hemorrhage; hepatomegaly; died 1/7/58	WBC, 15,500/cu. mm.; blood culture: negative after antibiotic therapy; enterococcus from navel culture; blood: potassium, 6.5 mEq./liter, sodium, 120 mEq./liter, chlorides, 468 mg.-%
							Autopsy: subdural hematoma; myocarditis with focal vasculitis; generalized vasculitis; chronic inflammation in umbilical vein	
13	M	11/21/57	3	4	4	Fever 38.8 C (102 F); cyanosis at birth and convulsions 11/25/57; vomiting; erysipelas over abdomen	Died 11/29/57	WBC, 5,800/cu. mm. CSF: bloody
14	M	11/23/57	4	9	9	Fever; listless and cyanotic; pustules in diaper area	Cardiac failure; slow improvement; discharged	WBC, 39,000/cu. mm.; blood culture: negative after antibiotic therapy; blood: potassium, 8.3 mEq./liter, sodium, 134 mEq./liter
15	M	11/25/57	6	30	Out-patient	Fever; erysipelas of right thigh	Recovered in 4 days	WBC, 31,000/cu. mm.; blood culture: negative
16	M	12/4/57	4	16	Out-patient	Secretions from cord; erythema about umbilicus; pustules over abdomen	Recovered in 4 days	Blood culture: negative
17	M	12/5/57	4	8	8	Fever 40 C (104 F); dyspnea; erythema about umbilicus	Discharged 12/16/57	WBC, 23,000/cu. mm.; blood culture: beta hemolytic streptococcus group A
18	M	12/6/57	3	11	12	Fever 38.3 C (101 F); diarrhea; anorexia	Afebrile in 12 hr.; discharged	WBC, 8,600/cu. mm.; blood culture: beta hemolytic streptococcus group A; blood: potassium, 5.6 mEq./liter
19	M	12/8/57	3	8	10	Fever 40 C (104 F); umbilical cellulitis; anorexia; vomiting; irritability	Appeared to respond at first, then died 12/22/57	WBC, 12,000/cu. mm.; blood culture: beta hemolytic streptococcus group A; blood: potassium, 5.1 mEq./liter 12/18/57, 8.5 mEq./liter 12/20/57

Case Data for Thirty Infants with Hospital Neonatal Infections (continued)

Case No.	Sex	Date of Birth	No. of Days After Birth to			Signs and Symptoms	Course of Disease	Laboratory Data
			Discharge from Nursery	Onset of Symptoms	Readmission			
20	M	12/ 8/57	5	11	Out-patient	Fever; irritability; umbilical erythema	Recovered in 4 days	...
21	M	12/ 8/57	5	11	Out-patient	Fever; irritability; umbilical erythema	Recovered in 4 days	...
22	M	12/ 8/57	(Transferred to nursery for premature at another hospital)	4 (While in nursery for premature)	...	Fever 38.3 C (101 F); listless; anorexia; vomiting; jaundice	Afebrile in 12 hr.; well in 5 days	WBC, 7,500/cu. mm.; blood culture: negative; blood: potassium, 4 mEq./liter, serum phosphorus, 8.3 mg. % bilirubin, 15 mg. %
23	F	12/ 9/57	4	10	Out-patient	Fever; irritability; umbilical erythema	Well in 4 days	...
24	F	12/10/57	3	7	4	Irritability; cyanosis; diarrhea; induration about umbilicus	Died 12/19/57 Autopsy: purulent umbilical vein to liver with streptococci demonstrated in pus; flabby, pale heart; endocardial thrombi; focal necrosis in liver	WBC, 32,000/cu. mm.; blood culture: beta hemolytic streptococcus group A
25	M	12/11/57	3	10	Out-patient	Fever 38.3 C (101 F); diarrhea; vomiting; umbilical irritation; pustules in diaper area	Well in 5 days	WBC, 18,300/cu. mm.
26	F	12/14/57	3	22	Out-patient	Dactylitis; umbilical erythema	Well in 5 days	Blood culture: negative; culture of umbilicus, enterococcus
27	F	12/14/57	4	7	Out-patient	Umbilical secretions; irritability; listless; abdominal pustules	Well in 3 days	Blood culture: coagulase-positive Staph. aureus
28	M	12/15/57	6	11	Out-patient	Fever 38.8 C (102 F); irritability; umbilical secretions	Apparently well in 2 days; returned at 26 days of age with fever; appeared to respond but died 30 days of age Autopsy: large, flabby heart with myocardial petechiae	WBC, 8,250/cu. mm.; blood culture: negative; blood: potassium 8 mEq./liter 1/11/58
29	M	12/17/57	3	4	4	Listless; anorexia	Died 2 hr. after admission Autopsy: dilated, flabby heart; aspirated amniotic material	...
30	M	12/17/57	4	4	4	Listless; cyanotic; mild jaundice	Died ½ hr. after admission Autopsy: dilated, flabby heart; partly healed and edematous navel	WBC, 8,500/cu. mm.; blood culture: negative 12/20/57

Laboratory Data: An elevated white blood cell count (more than 12,000 per cubic millimeter) was present in 11 of the 17 patients for whom it was measured. Hyperkalemia (serum potassium level more than 6.4 mEq. per liter) was noted in four of the seven patients for whom this level was obtained. All four patients with conspicuous hyperkalemia were in the critically ill group.

Response to Therapy: Patients were treated with various combinations of antibiotics (including penicillin, streptomycin, chloramphenicol, and erythromycin) after ordinary tests for bacterial sensitivity were done. In addition, some infants were given, more or less on an empirical basis, sulfonamides, steroids, and supportive therapy with digitalis, blood transfusion, and gamma globulin. No one regimen appeared to be uniformly successful. Infants with skin lesions tended to recover rapidly with penicillin therapy alone, while some patients died despite intensive antibiotic therapy and after follow-up blood cultures had been sterile. Two infants (see table, cases 19 and 28) died after an apparently good initial response to therapy but with a sudden recrudescence of fever followed by circulatory collapse; the asymptomatic interval was as long as 14 days in one of these infants.

With the hope of preventing further seeding of the blood stream, ligations of the umbilical vein close to the liver were performed in two critically ill infants. This procedure, however, did not seem to be of any real benefit.

After the recognition of a sharp increase in infections, prophylaxis with either chloramphenicol or erythromycin was given to all nursery contacts with or without symptoms starting on Dec. 19, 1957. Despite this, two infants died suddenly two and one-half days after institution of therapy with large doses of chloramphenicol. They had no unusual symptoms until a few hours before death.

Pathological Observations.—Eight of nine infants who died in the 1957-1958 outbreak were examined post mortem. It was noted most consistently that in seven of these eight there was conspicuous dilatation of both right and left sides of the heart, with soft and flabby myocardia in many instances accompanied by petechial hemorrhages. In the patient in case 12 there was an actual myocarditis in association with focal vasculitis which was part of a generalized picture resembling periarteritis nodosa in older subjects (fig. 2). The infant in case 24 had small endocardial thrombi between the papillary bundles and that in case 19 a slight chronic peri-

carditis. In the remaining five cases there was no evidence of gross or microscopic myocardial changes. In addition to a flabby heart in the patient in case 29, there was evidence of aspirated amniotic

TABLE 2.—Clinical Manifestations and Symptoms in Twenty-six Infants During Outbreak of Hospital Neonatal Infections

	Cases, No.
Male infants	16
Premature infants	2
Symptoms	
Fever (>37.7 C [99.8 F])	19
"Change" in infant (anorexia, listlessness, irritability)	17
Omphalitis (periumbilical erythema, moist or indurated umbilicus)	17
Skin lesions (erysipelas, pustules, cellulitis, or petechiae)	12
Respiratory signs (cyanosis or dyspnea)	7
Cardiac failure	7
Neurological signs (full fontanelle or convulsions)	4
Jaundice	2

contents; the infant in case 24 also had multiple areas of acute focal hepatic necrosis with early sup-
puration.

Of the seven patients in whom the brain was ex-
amined, four (cases 5, 8, 12, and 19) showed evi-
dence of hemorrhage within the substance of the
brain. In two (cases 5 and 8) there was also super-
imposed meningitis.

At the time of autopsy, four infants had no
gross evidence of umbilical infection, whereas the
other four had evidences of residual inflammation.
The ligamentum teres was sectioned and examined
in six; in all but one (case 29) inflammatory changes
were found. These changes varied from minimal to
massive suppuration which was found to contain
streptococci on direct smears (fig. 3). In summary,



Fig. 2 (case 12).—Focal vasculitis found at autopsy.

six of eight infants presented either gross or micro-
scopic evidences of umbilical infection in or about
the umbilical vein. Thus, there seems little doubt
that this structure was a likely or common portal of
entry for the lethal infection.

Investigation of 1957 Outbreak

In view of the developing epidemic situation,
delivery services were closed on Dec. 19, 1957, and
the 36 babies remaining in the nursery were trans-
ferred to their mothers' rooms until discharge. In-
vestigations were instituted by the hospital admin-
istration and medical staff. On Dec. 22, aid was
requested from Dr. John Bruce, epidemiologist, the
Louisiana State Department of Health, and from
the U. S. Public Health Service.

Nursery Procedures.—Masks and gowns were
worn by all personnel. On admission, infants were
bathed with water to remove the vernix; sometimes
oil was used if the vernix was particularly adherent.
Thereafter, the infant was sponged daily with sterile
water and wiped with oil if it was felt necessary.
Nothing was applied to the cord except a 70% alco-
hol solution. If the cord appeared to be separating,
it was covered with sterile gauze. After the cord
separated the umbilical area was sometimes

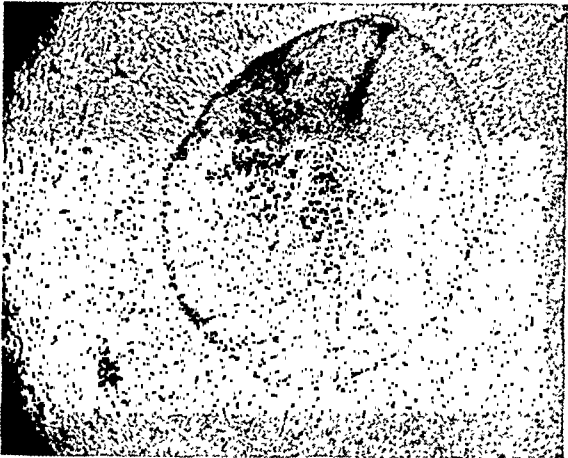


Fig. 3 (case 24).—Section of ligamentum teres with sup-
puration of umbilical vein.

swabbed with thimerosal (Merthiolate) and cov-
ered with sterile gauze. Circumcisions were per-
formed in an adjacent delivery room.

Bacteriology.—Group A streptococci were the pre-
dominant organisms among infected infants during
the explosive phase of the outbreak. However, bab-
ies were not infected by a common organism, for
cultures from various sources yielded several differ-
ent organisms over a four-month period. These in-
cluded group A beta hemolytic streptococci, group
D streptococci, hemolytic coagulase-positive staphy-
lococci, pneumococci, and *Proteus* species.

When the obstetrics services were closed, 10
navel cultures were taken from asymptomatic in-
fants still in the nursery. One of these yielded group
D alpha streptococci, one group D beta streptococci,
and one coagulase-positive staphylococci. Throat
cultures were taken from all personnel of the nur-
sery, postpartal floor, and delivery room. In the 60

persons tested, seven cultures were positive for beta hemolytic streptococci, five group A streptococci (all from nursery personnel) and two group B streptococci. None of these carriers were sick. In addition, cultures were done in 57 of the pediatricians, obstetricians, and general practitioners on the hospital staff. Five yielded beta hemolytic group B streptococci. (All cultures were screened either at the hospital laboratory or at the Louisiana State Department of Health laboratory [through the courtesy of Dr. George H. Hauser]. The beta hemolytic streptococci isolated were then sent to Chamblee, Ga., for typing by Dr. Elaine Updyke of the U. S. Public Health Service. The five group A streptococci isolated from nursery personnel were lost in transit, so their identification is based only on bacitracin tests done at our hospital laboratory. None of the group A streptococci could be typed by the serums presently available.)

Numerous fomites were also cultured, including all fluids used in the care of infants, and dust, gauze, diapers, cord clamps, and formulas. In addition, blood agar plates were exposed to nursery air overnight, and none of these cultures yielded streptococci, although coagulase-negative *Staphylococcus pyogenes* var. *aureus* was isolated from a stock supply of baby oil.

For comparison, throat cultures were taken from similar hospital employees at the city's other general hospital along with cord cultures from its newborn infants. Of 24 cords from which cultures were taken, none yielded streptococci but three yielded coagulase-positive staphylococci, phage type 44A. Of the 76 throat cultures taken from personnel, 7 had beta hemolytic streptococci, 5 group B, 1 group A, and 1 group D.

Records were reviewed to see if the ill infants had been cared for by delivery room personnel or had been received or handled in the nursery by personnel common to two services. No such correlations were possible.

Recommendations

As a result of the investigations carried on by our hospital staff, administration, and consulting epidemiologists, several changes were made in the nursery and obstetrics facilities, as well as in the procedures followed.

The nursery area was enlarged to 1,200 sq. ft. so that 50 babies could adequately be accommodated. This area was subdivided into four units, including one "observation" and one "suspect" nursery. A full-time supervisor was appointed to oversee both the obstetrics department and the nursery. It was agreed that when peak capacity of the nursery had been reached, the chief of service of the nursery would be empowered to close the nursery to further admissions. In addition, a permanent committee from the medical staff was set up to investigate all neonatal and puerperal infections.

A permanent nursery isolation unit was established in a separate area and a treatment room provided in the remodeled nursery for circumcisions and other minor procedures. Several changes were also made in the obstetrics unit, including construction of a separate room for delivery of patients suspected of having infection.

Comment

The striking common factor in both nursery outbreaks was overcrowding. The 1956 outbreak took place during a period when the census was relatively high and the nursery area temporarily reduced. The 1957 outbreak occurred again during a time when the nursery census was near a peak. It is, of course, difficult to control this census, since patients in labor often have emergency admissions, and it is true that there are seasonal variations. The nursery area, which was adequate in 1951, proved to be inadequate in 1957. This serious matter of nursery overcrowding could be alleviated if hospital planners and architects were required to maintain a fixed ratio of bassinets to postpartum beds with an excess in the nursery area (based on the recommendation of the American Academy of Pediatrics of a minimum of 24 sq. ft. per bassinet). Adherence to such a fixed ratio would eliminate the nursery overcrowding which plagues so many hospitals at peak seasons.

Although two organisms were isolated in the 1956 outbreak, *L. monocytogenes* was implicated in three of the four patients. Specificity of infection, with one developing six weeks after the first infection, indicates the possibility that a contaminated fomes or carrier among nursery personnel was responsible for secondary cases. Unfortunately, medical staff organization was such that no group or individual assumed authority to carry out a thorough investigation of this outbreak, and, therefore, no adequate immediate protective steps were taken. Later a committee from the medical staff did make certain recommendations. We believe such a permanent "watchdog" committee, responsible to investigate every neonatal and postpartal infection, is a necessary function of every hospital staff.

Since several different organisms were isolated in the 1957 outbreak, it seems doubtful that single specific fomites or carriers could be implicated. Overcrowding, with increased possibilities for errors in nursery techniques, seems to be a more plausible explanation. Streptococci (at least three types) were the predominant organisms isolated. Bacteriological investigation revealed group A streptococci in throat cultures from five workers in the nursery and group D streptococci in umbilical cord cultures from two asymptomatic infants in the nursery. Cultures from throats of personnel and from umbilical cords of neonates in another similar community hospital in the area at the same time revealed a

lower, although not statistically significant, percentage of beta hemolytic streptococci among the personnel and none from the infants. However, group A streptococci were recovered from a higher proportion of nursery personnel in the hospital experiencing the outbreak. Once streptococci were introduced into the nursery, the infection could have been passed from one infant to another and even to nursery personnel, as has been reported in two outbreaks in England,¹ where the nursery was suggested as the source of infection.

The most common symptom in the 1957 outbreak was a change in the infant, i. e., anorexia, apathy, or irritability. Smith and co-workers² have pointed out that the most common symptom in neonatal sepsis is "failure to do well." Omphalitis occurred in several of these patients, and it has been noted by others that omphalitis is frequently found in streptococcal neonatal sepsis.³ Jaundice, which was not a notable symptom, has been noted to occur only rarely in neonatal streptococcal infection.⁴

The frequency of cardiac failure and myocarditis, particularly in the fatal cases, leads to some speculation. Reports do not mention myocardial disease as a common feature in neonatal sepsis. In Dunham's review⁴ of 15 cases of streptococcal septicemia during the newborn period, cardiac failure was not a predominant symptom; autopsy was done in five infants in that series, but no mention of abnormality of the myocardium was made. The sudden collapse of some infants in our 1957 outbreak was presumably due to cardiac failure. This clinical picture resembled the neonatal myocarditis due to Coxsackie virus.⁵ Recrudescence of symptoms similar to that observed in two of our patients who died has been noted in some of these reports. During this outbreak, there was an unusually extensive epidemic of gastroenteritis among children and adults in the community; this was probably viral in origin. Consideration has been given to the possibility that the cardiac failure and poor response of some of these patients to antibiotic therapy or prophylaxis ensued as a result of a symbiotic relationship between streptococcosis and an unrecognized viral infection. In this connection, Pearce⁶ has demonstrated that a virus which infrequently causes a mild myocarditis in rabbits produces a severe and frequent myocarditis in rabbits if it is preceded by an intravenous injection of a *Streptococcus pyogenes* toxin. No viral studies were done for patients who died in this outbreak, because attention was directed to the bacterial septicemia initially. Stools of two infants (see table, cases 10 and 14) who were critically ill but recovered were passed through monkey kidney tissue, but no cytopathogenic agent was isolated. However, these stools were not collected until six and seven weeks after the acute illness, and it would be unusual to demonstrate Coxsackie virus from this source at such a late date. Focal cellular infiltrates in the myocardium have been described

in viral neonatal myocarditis^{3a} and also in fatal cases of hemolytic streptococcal infection.⁷ Post-mortem examination revealed hearts that were grossly dilated and flabby, but microscopic examination disclosed no patchy cellular infiltrations. Mallory and Keefer have pointed out that patients with fulminating streptococcal infections often have organisms present in the cardiac tissue, with practically no cellular reaction. Such cardiac changes have also been reported in connection with toxic reactions to antistreptolysin O in animal experiments.

The failure of some of these patients to respond to antibiotics used therapeutically or prophylactically again points up the false sense of security that antibiotics now impart.⁸ The "masking effect" of antibiotics was also notable; not a single blood culture was positive when the patient had received prior antibiotic therapy.

The increasing frequency with which nosocomial staphylococcal infections are being reported points up the desirability of "rooming in," smaller nursery units, or prompt discharge after postpartal recovery. The high incidence of umbilical infections in the 1957 outbreak reemphasizes the dangers of the cord as a reservoir of infection.⁹ The usual care of the cord with dry technique and no dressing should probably be reexamined. Consideration should be given to the use of dressings and daily application of antiseptics to the cord and surrounding skin in order to reduce its infectivity.

Summary

In one outbreak of neonatal infection in a nursery, the predominant organism was *Listeria monocytogenes*; in the second, more extensive outbreak, a variety of organisms, but predominantly group A streptococci, were recovered.

Both outbreaks were associated with overcrowding, and investigations revealed no other correlations. In both instances the umbilicus appeared to be a likely portal of entry for infection. The most consistent observation at autopsy in the 1957 outbreak was myocardial involvement. These epidemics again reveal the danger of nursery overcrowding with possible subsequent breakdown in rigid aseptic techniques.

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We wish to acknowledge the assistance of Drs. J. Bevan and A. McQuown, Baton Rouge, La., for making some of the pathological observations. Members of the obstetrics and pediatrics staffs of the Baton Rouge General Hospital gave permission for inclusion of private patients in this study.

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LITHOGRAPHER'S DERMATITIS

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Dermatitis is an important occupational hazard of lithographers,¹ affecting from 5 to 10% of the 30,000 workers in the industry. It is the cause of substantial economic loss because the affected persons may be unable to work and replacements require long training periods. Occupational dermatoses occurring in lithographers have been commonly termed "chromate dermatitis" and are ascribed to allergic sensitization to this agent, since chromate, a known sensitizer, is contacted in many phases of the lithographing process. In the present investigation a survey of the lithographing industry was carried out to attempt to ascertain the specific materials and processes which are the true causes of this occupational disease. A dermatological study was made of patients with dermatitis ascribed to occupational causes ("chromate dermatitis") in which materials contacted at work were used for patch tests. The long-term goal of this project was to develop methods of prevention and/or control of dermatitis among lithographers.

Survey of the Industry

Modern lithography is the process by which colored photographic pictures can be reproduced on high-speed printing presses. The "deep-etch" process, that most commonly used in the industry today, is performed as follows: The material to be reproduced is photographed, and positive transpar-

In a study of the cause and prevention of dermatitis occurring among lithographers, 100 men representing all job categories within the industry were examined, and 76 men with active eruptions at the time or in the past were compared with 24 men free from dermatitis. The data indicated that the most important chemical substances concerned were compounds of chromium but that defatting of the skin (by soaps and lipid solvents), trauma, and contact with acids and alkalis render the skin more susceptible to the action of primary irritants and allergenic agents. The use of mechanical protection of the hands interferes with delicate manipulations, and protective ointments interfere with the surface phenomena on which lithographing depends. Fundamental changes in procedure may be necessary in order to reduce the incidence of disability in this industry.

encies are made. A "grained" metal plate (one with the surface roughened by abrasive treatment) is coated with chromated albumen by the plate-maker. The positive photographic films are arranged on the plate in their proper position and sequence by the "stripper." This prepared plate with the film superimposed is then exposed to a

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Read in part before the Section on Dermatology at the 106th Annual Meeting of the American Medical Association, New York, June 5, 1957.

carbon arc-light, as is done with ordinary contact prints in photography. Since chromated albumen is sensitive to light, the photographic image is transferred to the prepared plate surface. This image is etched or fixed to the plate with a mixture of gum arabic, chromic acid, and phosphoric acid. The plate is then washed with water, which completely removes the chromated albumen from all unfixed areas leaving only the image area available for receiving the ink. This prepared plate is then consigned to the pressmen and feeders who ink the plate and complete the mechanical phases of the process in which the fixed image is transferred by the high-speed press from the plate to paper.

In the course of this complex process the pressmen and feeders must handle kerosene; turpentine; a turpentine substitute containing pine oil, castor oil, ester gum, and naphtha (Lithotine); phosphoric, chromic, and hydrochloric acids; gum arabic; potassium and ammonium dichromate; benzene; inks; asphaltum; and varnish remover. The platemakers must handle a preparation used to convert the surface of the zinc plate to an oxidation-resistant film and which contains sodium or ammonium dichromate, sulfuric acid, and water (Cronak); albumen; deep-etch coat (a preparation used to dissolve a small amount of metal in the image areas to make them ink-receptive which contains calcium chloride, ferric chloride, hydrochloric acid, and water); white etch (a solution of ammonium nitrate, ammonium phosphate, hydrofluoric acid, gum arabic, and water); ammonia water; and lacquer.

The strippers must handle film developer, "hypo," etch, carbon tetrachloride, dichromates, and acetic acid. Materials for patch testing were selected from this list of contactants, some of which are known sensitizers or primary irritants.

Dermatological Study of Industrial Workers

One hundred men representing all job categories in the lithographing industry were examined. Some of them had had previous episodes of dermatitis, usually of the hands; others had active eruptions at the time of examination; and 24 were normal controls. Dermatological examination, cultures for fungi of scaling lesions of the hands and patch tests with materials listed in the table were carried out in all cases. A clinical diagnosis of contact dermatitis of the hands was made in 60 of the 76 patients who were considered to have occupational disease. On patch testing, 47 (78.3%) of the patients with contact dermatitis exhibited positive reactions to one or more of the occupational contactants used in the test program, while only 16 of 40 subjects (40%) with diagnoses other than contact dermatitis showed positive reactions. The table lists the materials used in testing and the distribution of positive patch test reactions in the two groups.

Of 60 patients with contact dermatitis, 40 had hyperhidrosis of the hands and feet. Of 40 subjects without contact dermatitis, 19 had hyperhidrosis. The difference in incidence of excessive sweating between the two groups is probably not statistically significant. Positive fungus cultures were obtained in 10 of the cases of contact dermatitis (*Candida albicans*, 5; *Trichophyton mentagrophytes*, 4; *Epidermophyton floccosum*, 1). In the non-contact-dermatitis group, no positive cultures were obtained. Fungus infections may therefore represent a minor predisposing factor in lithographer's dermatitis; or conversely, patients with hand dermatitis may be more susceptible to fungus infections.

Results of Patch Tests

No.	Solution Substance	Concentration, %	Diluent	Reactions, No.		
				Con- tact Der- ma- titis	Non- con- tact Der- ma- titis	Posi- tive Reac- tions, No.
1	Lacquer (Albulac)		...	2	1	3
2	Machine oil	50	Olive oil	1	0	1
3	Benzine	60	Olive oil	1	0	1
4	Roller wash	50	Olive oil	1	0	1
5	Type wash 1	50	Olive oil	1	0	1
6	Lith-Kem-Kote					
	A. Undiluted		...	47	11	58
	B. Half-strength		Olive oil	12	3	15
	C. Quarter-strength		Olive oil	6	0	6
7	Type wash 2	50	Olive oil	4	0	4
8	Formic acid	1	Aqueous	2	0	2
9	Dichromated albumin	1	Aqueous	2	2	4
10	Ethylene glycol (Cellosolve) ..	Undiluted	...	3	2	5
11	Carbon disulphide	60	Olive oil	1	0	1
12	Potassium ferriyanide	10	Aqueous	1	0	1
13	Potassium ferrocyanide	10	Aqueous	5	0	5
14	Fountain etch	Undiluted	...	18	5	23
15	Turpentine	50	Olive oil	9	4	13
16	Potassium dichromate	1	Aqueous	17	2	19
17	Cobaltous nitrate	2	Aqueous	6	1	7
18	Kerosene	50	Olive oil	7	2	9
19	Nickelous nitrate	5	Aqueous	9	1	10
20	Chromic acid	0.5	Aqueous	20	8	28
21	Turpentine substitute (Lithotine)	50	Olive oil	6	3	9

Comment

The tabulated results indicate that the dermatitis found in 60% of this group is an occupational contact dermatitis in which the most important agent is hexavalent chromium, present as the dichromate. Pressmen and platemakers, who comprise over 75% of the patients with contact dermatitis of the hands, have the maximum exposure to dichromate. Positive patch tests to solutions containing chromium (numbers 6, 14, 16, and 20 in the table) occurred from two to eight times as often in patients with contact dermatitis as in those without. Altogether, there were four times as many positive patch test reactions to all the industrial contactants in the subjects with contact dermatitis as in the controls and in those with other derma-

Positive dichromate patch test reactions have been reported in patients with eczematous dermatitis caused by other agents. Klauder² showed that 13 of 18 patients with diffuse eczematous dermatitis without evidence of contactant cause showed positive reactions to a 0.5% dichromate solution. Similarly, Rostenberg and Sulzberger³ found positive patch tests with 0.5% to 1% solutions of dichromate in 12% of a miscellaneous group of dermatological patients, with and without contact dermatitis. Some of these reactions can be explained on the basis of nonspecific polyvalent hypersensitivity due to increased irritability of the skin of patients with eczematous dermatitis. This nonspecific reactivity usually disappears after the acute dermatitis has subsided; it must be differentiated from a true specific (allergic) hypersensitivity, which is based on immunological mechanisms. How many of the positive reactors in the present series belong to the former category could not be determined.

If dichromate sensitization is the major cause of dermatitis in lithographers, it would be reasonable to expect in the group with contact dermatitis a higher percentage of positive reactors with test substances 14, 16, and 20. As it was, there were only 17 positive reactions to 1% potassium dichromate. Conversely, it is necessary to explain the fairly numerous positive patch tests with various substances in the noncontact dermatitis group. It may be that the positive reactions in these cases indicate subclinical levels of allergic sensitivity. Possibly the recommended testing concentrations such as 0.5% potassium dichromate and 0.5% chromic acid, are high enough to cause reactions on the basis of direct "primary irritancy" in some individuals when applied under an occlusive patch for prolonged periods. The concentration to use in testing with dichromate is probably less than 0.5%; otherwise reactions may develop on the basis of direct irritancy and erroneously be attributed to sensitization. The importance, for patch-testing purposes, of the proper dilution of possible irritants is further demonstrated by the reactions to Lith-Kem-Kote (dichromate, phosphoric, and hydrochloric acids, and casein). Here, dilution to half-strength reduced the number of reactions from 58 to 15 and dilution to quarter-strength reduced them to 6. Thus the finding of a positive patch test is not necessarily indicative of sensitization.

Exposure to lipid solvents is frequent among pressmen, who also show the highest incidence of dermatitis. To determine the role of defatting agents as causative factors in the production of sensitization dermatitis animal experiments were carried out, comparing sensitization rates to contact with dichromate, with and without preliminary application of solvent to the skin. Twenty-four guinea pigs were used in the study. In one group of 12, 1% potassium dichromate solution was ap-

plied to a thoracic clipped skin site every other day for five times. Ten days after the last application the animals were challenged with the same solution, with no reactions. The procedure was repeated in the same group, and again no eczematous dermatitis was elicited. The second group of 12 guinea pigs was tested in the same way, except that before each application of 1% potassium dichromate solution the skin site was defatted by vigorous swabbing with petroleum ether. When examined after the 10-day waiting period, 6 of the 12 animals showed reactions ranging from 1+ to 4+ in intensity, with the test solution diluted to as low as 0.05%. From these results, it seems clear that there is a synergistic effect of defatting agents with chromate in the development of an allergic eczematous contact-type dermatitis.

It can be concluded that occupational dermatitis is caused by a complex of factors but that there is a single pattern of pathogenesis. Defatting of the skin, trauma, and contact with acids and alkalis are of importance in facilitating penetration of the allergenic agent, which in many cases is the chromate ion. For example, in the work of pressmen and feeders the sharp-edged photographic plate is handled many times in the course of setting it for the press, and minor injuries to the skin are frequent. The surface of the plate is sponged repeatedly with "fountain etch," which contains dichromate in dilute acid solution. At this time these workers usually wash their hands with soap and water, which has the combined effect of defatting, drying, and alkalinizing the skin. Then removal of ink from the rollers, the part of the printing press which applies ink to the plate, and the rubber blanket, the part of the printing press which receives the imprint from the inked plate and transfers this image to paper as the final step in the lithographing process, is carried out by hand, with use of a cloth saturated with solvents such as turpentine, benzine, or Lithotine. The worker then washes again with soap and water, and the cycle is started anew. It may be repeated as many as six times a day.

While the pressman has his hands in and out of water and solvents all day, the platemaker uses practically no solvents at all in his work. This circumstance could explain the higher incidence of contact dermatitis in pressmen (53% of this series with contact dermatitis) as compared to platemakers (23%), as well as the fact that it took on the average only 5 years for contact dermatitis to develop in pressmen as compared to an average of 15 years in platemakers. The combination of physical trauma, defatting the skin, drying, and intermittent acidification and alkalinization, followed by exposure to a sensitizer or irritant such as ammonium dichromate, induced the typical dermatological reactions seen in lithographers.

Protective creams of all types have been tried in the industry for years with little or no success. A protective cream may be effective against either oily or aqueous agents but not against both. Lithographers may use fat solvents (benzene or turpentine) and aqueous irritants in consecutive operations. It is likely that at some step in the process the protective coating will be rendered soluble. Mechanical removal may also interfere with the continuous maintenance of a coating of the protective ointment. This same objection can be raised on theoretical grounds to the topical use of chelating agents, regardless of the type of vehicle employed. Even if chromates could be chelated and eliminated as a sensitizing factor, other agents, particularly the solvents, might produce dermatitis on a primary irritant basis. Preliminary trials with a protective cream containing edathamil (ethylenediaminetetra-acetic acid) and a reducing agent failed to demonstrate protection in any of the subjects used.

Suggestions for Minimizing Dermatitis Among Lithographers

The prevention of dermatitis among lithographers is difficult to achieve. Complete protection of the hands with rubber gloves would be desirable, but the handling of materials is thereby rendered cumbersome, as when protective creams are used. Furthermore, aside from the difficulties of repeated applications of ointment, grease on the hands is undesirable because it is likely to be transferred to the plate where it will interfere with the printing process. Thus no simple or complete solution of the problem is likely because of factors inherent in the lithographing procedure.

At present, because of the persistent nature of the dermatitis, it must be recommended that any worker showing evidence of cutaneous disease related to his occupation be transferred to some other job category. "Prophetic" patch tests cannot be of real value in advance in eliminating the predisposed worker from a job, since prolonged contact is required before sensitization is engendered.⁴ In addition, the prophetic patch tests can-

not reproduce the complex conditions of actual exposure as described. It is probable, however, that some control of lithographers dermatitis can be effected through the following measures: (1) safety engineering procedures, to minimize contact with known hazardous chemical agents such as chromate, acids, or turpentine; (2) research toward the development of nonirritant, nonsensitizing materials to replace those with known undesirable dermatological properties; and (3) further research into the possibility of repelling, neutralizing, or separating chromate which comes in contact with the skin.

Summary

Contact dermatitis among lithographers is an important industrial problem. Fat solvents and primary irritants are factors contributory to the pathogenesis of sensitization to chromate, the most common allergen. Future investigative work should be directed toward methods of minimizing, both for the employee and in the industry, the factors which are operative in the production of this disabling disease.

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EXERCISE TOLERANCE.—Artificial restrictions should not be placed on the physical activity of patients who already have symptoms of coronary disease, and, within reason, the patient should be allowed to decide his own level of exercise tolerance. In this way a better coronary collateral circulation might be encouraged, and, in theory at least, the extent of a further myocardial infarct might be limited. The rest of us in sedentary occupations should endeavor to take more exercise regularly, although sudden and violent exertion is probably undesirable, particularly in middle age. Studies of the protective action of leisure activities are now indicated. Meanwhile some good might be done by walking part or all of the way to work and by being less dependent on cars, buses, and lifts. The active in mind should make time to remain active in body.—Physical Activity and Coronary Disease, Editorial, *British Medical Journal*, Dec. 20, 1958.

TO DO OR NOT TO DO A CESAREAN SECTION

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and

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To do or not to do a cesarean section: this is the question which is posed with varying frequency to all obstetricians. The decision must be based on an entirely new set of standards; the old ones are no longer tenable. Our goal is a perfect end-result for both mother and baby.

As Eastman¹ has stated, "The transcendent objective of obstetrics is that every pregnancy culminate in a healthy mother and a healthy baby. It strives to reduce to a very minimum the number of women and infants who die as a result of the reproductive process or who are left injured therefrom. It aims further to minimize the discomforts of pregnancy, labor and the puerperium; and, at the same time, so to safeguard and ease the whole course that both mother and child will conclude the experience in a healthy state, both physically and mentally."

Maternal and Perinatal Mortality

The statistics quoted in this paper are taken from the Cedars of Lebanon Hospital, Los Angeles. The opinions, however, are those of the authors and, in some instances, do not reflect those of other members of the staff. In 1950, one of us (J. M. H.) presented a review of 21,000 deliveries, including 2,070 consecutive cesarean sections performed at the Cedars of Lebanon Hospital in the period 1937-1950. As of April 1, 1958, covering a period of 21 years, these totals have reached 40,423 and 4,397 respectively. Included are figures from both private and clinic groups. The clinic patients represent only a small segment, as our clinic service in obstetrics is only six years old. This is probably the largest series of cesarean sections ever reported from one institution.

At this point we wish to stress that the statistics offered are not corrected in any way. The maternal statistics include all maternal deaths and are not corrected for conditions which are not related to the pregnancy or for death with remote proximity to the pregnancy. Fetal statistics include all stillbirths over 300 Gm. (% lb.) in weight. Neonatal deaths include all fetuses exhibiting any vital signs at birth, regardless of weight and gestational age, congenital defect incompatible with life, Rh or

During a period of 21 years, in an institution where 40,423 deliveries were performed, there were 4,397 cesarean sections. The maternal mortality for these was 0.081% as compared with 0.052% for vaginal deliveries, and in the series of 1,826 elective repeat cesarean sections the maternal mortality was zero. Dictums expressing recent improvements in anesthesia, surgery, and obstetrics. There has been too much emphasis on the frequency of cesarean sections in various hospitals as the chief test of obstetrical conservatism. The frequency of maternal and fetal deaths is the more reliable test, and the ideal should be a perfect end-result for both baby and mother. This should include preservation of vaginal functions, which are too often deranged seriously by the tears, infections, and other trauma of vaginal deliveries. Close attention to indications and technique of cesarean section should increase the percentage of pregnancies that terminate happily for all.

ABO incompatibility, or any other factors complicating the pregnancy which could be considered responsible for fetal death. Table 1 presents these figures with the associated maternal mortality.

Table 2 presents an analysis of the associated perinatal deaths over a selected period from 1952 to 1955. These were chosen due to the fact that, beginning with 1952, one of us (J. A. N.) has begun a comprehensive analysis of the fetal mortality, which will be presented in detail in a later publication.

Figures from the U. S. Department of Vital Statistics show that there has been a significant consistent decrease in maternal mortality throughout the United States over the past 21 years. There has also been a moderate decrease in the perinatal mortality, which does not seem to have kept step with the maternal mortality. We realize that these statistics cover deliveries made under all types of conditions and in all parts of the United States, including rural districts as well as the populated areas. We feel, however, that, along with the other

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Read before the Section on Obstetrics and Gynecology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

important conditions to be mentioned later, the judicious and increased use of cesarean section has been a large factor in improving these statistics.

This presentation is concerned with the analysis of the statistics derived from our entire series and particularly from the most recent portion, the

TABLE 1.—*Maternal Mortality, July 31, 1937, to April 1, 1958*

Delivery	Total No. of Cases	Deaths	
		No.	%
Vaginal	36,026	19	0.052
Cesarean section	4,397	4	0.081
Total	40,423	23	0.059

thoughts aroused by this analysis, the technique which has been used, and inferences which we feel should affect the decision whenever cesarean section is considered.

Incidence of Cesarean Section

Elective repeat cesarean section was done 1,826 times, with a maternal mortality of 0 and a perinatal mortality of 1.7%. Our figures show the almost complete safety with which cesarean section can be performed when there are no complicating factors and when the conditions and advantages of a fine hospital and a trained staff are available. The operation per se can be considered an almost innocuous procedure as far as the maternal mortality is concerned. We feel that our small perinatal mortality can be lowered with more accurate diagnosis of the due date and with more gentle delivery of the baby, both of which factors will be discussed more fully later in this paper.

Along with technical skill, the utmost skill in judgment is of paramount importance. This judgment must be employed in evaluating each situation and, most particularly, in timing. Procrastination, rather than improper selection of candidates, has too often been the determining factor behind the neglected cases for which mortality figures have been so high. It is indeed unfortunate that our teaching institutions and some textbooks have emphasized instruction in the technique of vaginal delivery without emphasizing the role of cesarean section in the obstetrician's armamentarium. The impression has been given that cesarean section is a dangerous modality which should be employed only as a last resort. Some obstetricians, well trained in the art of manipulation, feel it a tribute to their personal competence when they accomplish difficult delivery of a baby even when the risks are considerable. Many times, having to resort to a cesarean section carries a stigma of defeat. But how many times do these doctors then experience regret? Practitioners of lesser training and ability also face difficult obstetric situations at times. These men should be taught to recognize the proper indications for the procedure so that their patients will receive the best method of treatment available. We

feel sure that this can be accomplished if the contraindications for the operation receive less stress and the dangers of manipulative techniques are emphasized.

As Plant² has pointed out, we can understand why the efficiency of an obstetrics service was judged by the lowness of its cesarean section rate when we remember that maternal mortality for this operation was 85% prior to 1865 and was still as high as 10% by 1934. Some authors, today, still plead for a reduction in the rate of cesarean section because of results reported in a recent review of the world literature which still show a high maternal and fetal mortality. Of 19,251 sections performed throughout the world between 1939 and 1953, the maternal death rate was 1.79%. Belonoschkin,³ who analyzed this world series and then compared the figures with those of his own country for 1952-1953, reported that, of 2,713 sections performed in Sweden with a cesarean section rate of 1.2%, the maternal mortality was 1.3% and the fetal mortality was as high as 7%. It is not hard to understand the reasons for this high maternal and fetal mortality when we consider the low incidence of the operation.

We strongly urge that cesarean section be freed from the burden of fear which has for so long been attached to its performance. There is no sound reason to cling to antiquated dicta which date from the era when modern hospital facilities were not available and abdominal surgery was considered dangerous.

Cesarean section has been singled out as a dangerous operation above other, far more difficult, procedures in the surgical field. The senior author takes issue with the discriminatory regulation which makes mandatory a consultation before the performance of cesarean section. He does not disagree with its purpose, but he disagrees when this rule applies only to obstetricians, for it then reflects on their integrity and craftsmanship as a group. Were the regulation made to apply to all surgical procedures, there would be no fault to find. The modern ob-

TABLE 2.—*Perinatal Deaths, 1952-1955*

	Delivery		Total
	Cesarean Section	Vaginal	
Live births, no.	1,153	8,253	9,406
Neonatal deaths, %	2.25	1.27	1.39
Stillbirths, %	1.04	1.16	1.15
Perinatal deaths, %	3.29	2.43	2.54

stetrician is no longer just a midwife. His training is equal to that in any of the other surgical specialties.

In order to conform with this regulation, and in an attempt to reduce the incidence of cesarean section at Cedars of Lebanon Hospital, a cesarean committee was formed. Whenever an attending man has a case in which difficulty is expected at the

time of delivery, and in all cases of repeat cesarean section, the case in point is reviewed thoroughly and recommendations are made. In an emergency cesarean section, a member of this committee must be called in consultation before the operation is permitted.

Incidence has become a red flag in the present controversy. Twenty years ago a section rate of 2% was considered high. As knowledge and statistics improved, the accepted incidence rose to 5 or 6%, which is now the standard for many private institutions. A great part of the rising rate of cesarean section in the United States can be attributed to the fact that a previous section is almost always an indication for a repeat section. It is our belief that incidence in itself is not important, since our ultimate goal is the attainment of ideal results.

Techniques

As incidence has increased, we find also better-trained hospital staffs, more hospitalization, better prenatal care, and a greater realization and understanding of the problems which may confront us. We have available to us all those facilities which can be found in every fine institution. These include adequate nursing service and the availability of blood and antibiotics. There are other conditions, however, under which cesarean sections are performed at our hospital, which have helped to improve our results. A fully equipped room is reserved on the obstetrics floor for performance exclusively of cesarean sections. The services of qualified anesthesiologists are available on the delivery floor 24 hours a day. Regional block has been the anesthetic procedure of choice almost without exception. On our service, it carries no greater risk to the mother than any other method and provides much greater protection for the baby.

Liberal medical and surgical consultation is employed in cases in which there are any complications. Every baby delivered by cesarean section is seen immediately by a pediatrician present in the delivery room. Rarely does the need arise to perform section when the patient's general condition has attained such a poor state as to make the procedure dangerous. In the elective repeat group, the amount of premedication administered is almost nil. With the exception of seven cases, all of the sections performed at our hospital during the last eight years were of the low cervical type. A modified Pfannenstiel's incision was most frequently employed.

Our technique deserves description. In the analysis of the fetal mortality in the early series, we found an inordinate incidence of rupture of the falx cerebri and tentorium cerebelli with resulting cerebral hemorrhage. This was reminiscent of the pathology found in fetal death associated with breech delivery and due in great part to traction, especially when the head was not kept well flexed.

D'Esopo⁴ has presented an excellent description of the management of breech delivery. The same precautions must be applied to delivery of the child from the uterine abdominal incision.

The exposure should be adequate, the baby's head freed from the pelvis, if impacted, before the uterus is incised, and a transverse low cervical elliptical uterine incision employed. The head is delivered with gentleness and care, with the hand used as a vector in the "shoehorn maneuver." There should be no traction on the baby's neck. The delivery should be effected chiefly by guiding the shoulders through the incision with the head kept well flexed while pressure is exerted on the fundus by the assistant. The baby is then handed to the pediatrician, and, should resuscitation be necessary, it is accomplished with as little shock as possible. When the baby is breathing well, the stomach is aspirated and lavaged and the baby is placed in a warm bed. The exercise of these conditions and techniques is important in producing a successful termination of the pregnancy.

Value of Cesarean Section

Fetal indications are gaining increasing importance in the rising incidence of cesarean section. By the more frequent use of this procedure we feel that a reduction in fetal mortality and morbidity can be accomplished. We find that no amount of medical attention or cost is spared an already living child who develops a serious condition, yet the life of the unborn infant seems rarely valued as highly. We cannot become callous about the traumatic psychological experience which parents endure at the loss of a child during delivery. This is a problem which the obstetrician must regard with deep concern.

For an isolated example of this problem, we cite Townsend⁵ who advocated conservative treatment of abruptio placentae in a recent article. In his summary, he describes 73 cases, in 10 of which fetal death might have been prevented by cesarean section. We are forced to ask "What price is a newborn life?" Although his incidence of cesarean section would have been raised, how much better to have performed 73 cesarean sections and saved 10 lives!

While we do not suggest abdominal delivery as the solution for all obstetric difficulties, we wish to reemphasize the advantages of cesarean section where there is any doubt as to a successful outcome. Although the lifesaving value of cesarean section is no longer questioned, the factor of morbidity, both maternal and fetal, is frequently overlooked. Our aim should be the eventual elimination of all traumatic deliveries. With the welfare of the patient and her family as our foremost consideration, let us take another look at the advantage of cesarean section over difficult or complicated vaginal procedures. It must now be conceded that cesarean section provides a safe and easy substitute for those manipulative procedures which have so often re-

sulted in damage to the mother and child. In 1945, Irving⁶ compared the results of mid-forceps delivery with cesarean section and demonstrated that mid-forceps deliveries were equally as dangerous for the mother and eight times as dangerous for the baby.

Gold and co-workers,⁷ comparing the relative dangers of the various delivery procedures, found that, in New York City in 1948, 1.7 infants per 1,000 received birth injuries. The rates of injury per 1,000 live births, by type of delivery, were as follows: spontaneous, 0.21; low forceps, 1.3; cesarean section, 1.3; mid-forceps, 14.4; high forceps, 17.5; breech, 14.0; and version and extraction, 30.0.

It is important to note that, from the point of view of trauma to the baby, the incidence for cesarean section and low forceps delivery is the same. Most accoucheurs will now agree that cesarean section has virtually replaced the use of Dührssen's incisions, version and extraction, high forceps, difficult mid-forceps, difficult breech extraction, and many other potentially dangerous vaginal maneuvers. In our last 9,498 cases, we found that there were 7 deaths due to birth injury of babies delivered through the vagina, giving an incidence of 0.73 per 1,000 births. We feel that the use of cesarean section has resulted in this low figure.

It is essential that the pregnancy be terminated with a live, healthy baby and the number of mentally deficient, spastic, and otherwise deformed children be decreased or, if possible, eliminated. As obstetricians, we usually terminate our care of the pregnant woman on delivery. Rarely do we have the opportunity to see what the heartbroken parents and the pediatricians, psychiatrists, and institutions for the retarded see as the end-result of our work. As Hellman⁸ has pointed out, it is rare that these patients return to the obstetrician in whose hands they experienced such bad results.

Culmination of the pregnancy with minimal damage to the mother is another prime consideration. The effects of traumatic delivery on the mother can be classified into two groups: immediate and delayed. The immediate results have to do with both mental and physical outcome. Difficult vaginal deliveries many times require extensive surgical repair of torn tissues, the necessity of blood transfusion with its accompanying hazards, the possibility of infectious states, prolonged hospitalization, and unnecessary physical pain.

The importance of preserving the vagina and surrounding structures and supports from traumatic injury should not be overlooked. We frequently hear that we are losing sight of the vagina as a birth canal. It is the belief of the senior author that we must not neglect the importance of the vagina as a sex and reproductive organ. Severe lacerations can result in weakening of the vaginal vault and other supportive structures, with its associated complications, and, not infrequently, in impairment of

the sexual function of the mother. In predisposed patients, such gynecologic invalidism with respect to discomfort of the patient and anxiety as to the prospect of future surgery and childbearing is of vital importance. Delayed morbidity includes that of trauma to the urethra and bladder, rectum, vagina, cervix, and even uterus. Unfortunately, the most important traumatic changes do not appear until sometimes the third but usually the fourth, fifth, or sixth decades of life. During this period women present themselves with urethroceles, cystoceles, rectoceles, prolapse, lacerated cervix, and similar conditions. We agree that not all of these conditions are caused by trauma alone, but it is undoubtedly a large factor. The handling of these complications then requires operative procedures at an age when the patient's condition is not at its optimum. How much better it is to practice prophylactic medicine when the opportunity presents itself.

Indications

In our reevaluation of the indications for cesarean section, we may state in a broad sense that it should be our purpose to preserve the integrity of the organs and functions of both mother and child. We are presenting the following criteria for reevaluation, listed in the order of frequency in our series:

Repeat Cesarean Section.—As the incidence of cesarean section has increased, the incidence of repeat cesarean section accordingly becomes a greater factor. Approximately 46% of all cesarean sections performed in our hospital from 1950 to 1958 were of the repeat type. Many of these patients had their primary procedure at another hospital. There was no maternal mortality in 1,826 consecutive repeat cesarean sections. In view of the possibility of the catastrophic results which occasionally follow rupture of the uterus, it is our opinion that the dictum of "once a section, always a section" should be adhered to. We have shown that repeat cesarean section is a comparatively innocuous procedure. We see no necessity, as has been suggested by Cosgrove⁹ and other authors, for a patient to go through labor where there is even a remote possibility of uterine rupture. It is interesting to note that Connell and Gendreau,¹⁰ also from Margaret Hague Maternity Hospital, admit that rupture of the uterus is not infrequent enough to be disregarded. Eastman, in his discussion of this paper, states: "If you happen to decide on vaginal delivery and the uterus ruptures, there is no error in all obstetrics which carries a higher penalty." This entire discussion is well worth reading.

In reviewing the 2,327 cesarean sections performed between 1950 and 1958, we found one case of uterine rupture after a cesarean section. This occurred during the sixth month of pregnancy when the patient was at home asleep. She was not in labor. The primary section was of the classic type and had been performed elsewhere.

It is of the utmost importance that a thorough evaluation of the history and physical findings be made in order that the expected due date be properly estimated. If the due date cannot be accurately ascertained, the patient should be allowed to go into labor prior to the performance of cesarean section. Only threatened rupture of the uterus should countermand this rule. The important thought which we have gleaned from the authors who recommend vaginal delivery after prior cesarean section is that a short period of labor carries very little risk of rupture of the uterus.

Fetopelvic Disproportion.—Next to repeat cesarean section, fetopelvic disproportion has been our most frequent indication for cesarean section. Any patient who exhibits a borderline or small pelvis should be properly evaluated prior to onset of labor. Stubborn determination on the part of the physician to accomplish vaginal delivery in spite of disproportion is too often one of the main causes of trauma, and it is in this group, when a prolonged labor has been terminated by cesarean section after prolonged rupture of the membrane, a period of dehydration, possible infection, exhaustion, and blood loss, that we see a high maternal and fetal mortality and morbidity.

Breech Presentation: There is no reliable clinical or radiologic method of estimating the relationship between the maternal pelvis and the fetal head in breech presentations. If, by clinical or roentgenographic tests, the pelvis appears small and/or the baby large, and a satisfactory progress of labor is not seen, a cesarean section should be done. As has been shown by Goethels¹¹ at Boston Lying-in Hospital, there is an increasing tendency to perform cesarean sections for breech presentations since a greater number of babies are salvaged by this method. In our hospital, section was performed in 14% of all cases of breech presentations.

Cephalopelvic Disproportion: An adequate trial of labor should indicate to the attending physician the choice of delivery when cephalopelvic disproportion is present. The patient's age, general condition, previous obstetric history, parity, and other factors should be taken into consideration. It is in the handling of this problem that persistence in vaginal delivery has led to so many bad results.

Uterine Bleeding.—Unless delivery is imminent in abruptio placentae, particularly where there is a living baby, procrastination is dangerous. This has been shown repeatedly in large series of cases. The dangers to the mother, irrespective of blood loss, are well known. The relationship of such conditions as afibrinogenemia to abruptio placentae are well established, and uteroplacental apoplexy (Couvelaire uterus), although rare, is still a factor to be considered. Hysterectomy, which is not infrequently an end-result in these cases, prevents future child-bearing. The possibility of intrapartum death and neonatal mortality increases unnecessarily as time

advances in the course of labor in abruptio placentae. In partial placenta previa, unless blood loss is small and the patient is making satisfactory progress, we see no advantage in relying on blood transfusions or on a period of "watchful expectancy" during the course of labor when many of the end-results have been shown to be so disastrous. All patients with central placenta previa are automatically subjected to section.

Fetal Indications.—As has been widely attested by the extensive literature written on the subject, by Eastman and Nixon,¹² Halsey and Gordon,¹³ and others, fetal distress as an indication is becoming much more widely accepted, since cesarean section has been shown to decrease the associated perinatal mortality. Such factors as consistent changes in the fetal heart tones, especially when they are on the low side, and meconium in the amniotic fluid in patients with cephalic presentation have been suggested as indicating interference on behalf of the infant.

It is conceded by all that there are certain "high priority babies." This group includes babies of primiparas 35 years of age or over in whom it has been shown that postmaturity is very dangerous. Anoxia becomes an increasingly important complication in this group. An adequate but not protracted trial of labor with poor or no progress constitutes an indication for cesarean section in these patients. Also included are cases in which babies have been lost during previous traumatic deliveries, cases of habitual abortion, and cases of infertility in which the patient has become pregnant after long periods of treatment. The method of delivery should be one which involves the least risk to the baby.

Diabetes.—Diabetes could well be listed under fetal indications. We feel, however, that it deserves specific discussion. Under the cooperative efforts of the obstetrician, internist, and pediatrician, the maternal mortality is now no different for the diabetic than for other obstetric patients and the fetal mortality has been reduced significantly. Controversy exists as to the time and method of delivery. Most of our diabetic patients were operated on at 36 to 38 weeks, the indication being primarily fetal. We feel that a section before term offers the best chance for the baby for the following reasons: 1. As a rule, the baby of a diabetic mother behaves very much like a premature infant, regardless of its weight. 2. Since this is true, analgesia and inhalation anesthesia is not well tolerated. 3. Dystocia due to disproportion with prolonged labor is not infrequent, many times requiring operative procedures which these babies do not tolerate well. 4. Few cervices are ripe enough at 36 to 38 weeks to permit easy induction of labor. 5. Failed or unsatisfactory inductions are factors which decrease the chances of survival. 6. There is an increasing incidence of fetal death in utero during the last weeks of gestation.

7. The incidence and severity of toxemia in diabetic mothers increases in the last few weeks of pregnancy.

With the exception of a few easily inducible multiparas and primiparas, most of our patients were subjected to section. In our series, 67 patients were operated on with no maternal death. One neonatal death in the repeat section group was due to hyaline membrane disease. Since these results have been so good, we feel that this method of management has a great deal of merit. An excellent presentation of the subject is given in the recent article by Black and Miller,¹⁴ in which they report that three out of four of their patients were subjected to section. In this series of cases, studied for the period 1945 to 1957, they managed to cut their material mortality to zero, although their neonatal mortality still remained as high as 16%. These authors state that statistics from various medical centers throughout the United States still show a fetal mortality of 10 to 50%. In a local general hospital, where the policy has been attempted induction of labor with cesarean section reserved only for those patients in whom induction has failed, fetal mortality is about 25%.

Uterine Inertia.—Whenever uterine inertia results in prolonged labor with poor progress, the possibility of maternal infection and exhaustion points to a questionable outcome. We feel, however, that the importance of this indication will decrease with the judicious use of oxytocin (Pitocin) infusion.

Pelvic Pathology.—Preexisting pelvic pathology which would have necessitated eventual hysterectomy has been an occasional indication for cesarean section in this series on the basis that it would obviate the need for a second surgical procedure with its additional attendant risk, cost, and inconvenience to the patient. The chief of a leading obstetric service in the United States recently visited our hospital and, in the discussion of this indication, agreed that it was valid. He would not, however, accept this indication in his hospital because he felt that it added greater danger to the delivery and also that it would increase his cesarean section rate. It is interesting to note the impact which overconcern with incidence has on the thinking and policies of workers in many institutions. Here, again, we must stress the fact that the patient comes to us for proper medical attention and not to create statistics!

Toxemia.—In private practice, toxemia has become a relatively infrequent indication for cesarean section in recent years. Good prenatal care and newer preparations for combating this problem are no doubt responsible for our not having seen a patient with eclampsia in the past eight years. We believe, however, that cesarean section should be performed in any patient with preeclampsia near term who is not inducible and who does not respond to proper and adequate therapy.

Previous Uterine Myomectomy.—Previous surgery on the myometrium with special reference to myomectomy involving deep incision into or through the uterine wall constitutes an indication for elective cesarean section.

Miscellaneous.—Prolonged retention of a dead fetus in the latter weeks of pregnancy where induction has failed is an indication for cesarean section when the possibility of afibrinogenemia is present. Special consideration should be given those patients having certain medical or surgical conditions not related to the pelvis in whom consultants recommend that the process of labor should not be undergone. Malpresentations, such as transverse, shoulder, and other abnormal presentations, represent a small segment in this group. Cesarean section is also done when the patient has had previous vaginal plastic surgery. There are numerous other occasional conditions which call for the use of cesarean section. We do not consider, however, that they occur frequently enough to warrant tabulation.

Comment

We should like to present our views concerning the many criticisms which are still leveled against cesarean section and its rising incidence. In regard to prematurity in the repeat cesarean section group, this seldom occurs if one attempts to ascertain the accurate due date and rigidly adheres to the criteria listed in reference to repeat cesarean section.

Another criticism has been "increased incidence of hyaline membrane disease." In a recent study made at our hospital by Edward Cantor and associates, it was reported that there were 36 cases of proved hyaline membrane disease during the period 1951 to 1957 in 14,423 deliveries. While the incidence of hyaline membrane disease was found to be three times greater in the cesarean section group, a further analysis revealed that in 50% of the cesarean section group the length of gestation was 34 weeks or under and two-thirds of the babies weighed less than 2,500 Gm. (5½ lb.). In this group, four patients were operated on for bleeding due to placenta previa, one for ruptured uterus, one for diabetes, one for severe toxemia, one for cephalopelvic disproportion, and one for a rising Rh titer in a previously sensitized mother. Two cases in the repeat group were uncomplicated. From this we may conclude that the operation per se was not responsible for the increased incidence of the disease but, rather, the ill considered timing and the conditions for which the section was done.

Colvin¹⁵ has stressed that the factors of remuneration and convenience are elements tending to expand the performance of cesarean section. It is apparent that the incidence of cesarean section is invariably higher in private practice than on the clinic service of the same operator. Erhardt and Gold¹⁶ have shown in their recent publication that in New York City this incidence is 56% higher for

RECURRENCE OF ASIAN VARIANT INFLUENZA IN THE FAR EAST

REPORT OF 1958 EPIDEMIC IN MARINE CORPS ON OKINAWA

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The 1957 influenza pandemic arose in the Far East and spread around the world.¹ This pandemic was caused by a new set of influenza A viruses.² There has been considerable speculation and justifiable apprehension about the possibility of a second world-wide epidemic due to this new Asian variant strain. This is a report of the recurrence in the Far East of influenza proved to be due to the Asian variant strain. This outbreak occurred in August, 1958, among previously vaccinated U. S. Marines stationed on Okinawa.

Materials and Methods

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Viral antigen and chicken antiserum of strains A/Japan/305/57 (Asian variant), A/Denver/1/57, and B/GL/54 were also obtained from the CDC. The A/Japan/305/57 strain in its egg line was employed as antigen in these studies for both HI and complement-fixation tests. In the complement-fixation test the whole virus antigen was used. For the HI test all serum was pretreated with periodate according to the 15-minute method suggested by the CDC.

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private patients than for general service patients. We question whether this be due to mercenary motives or rather, more probably, to the physician's desire to protect his private practice by doubly insuring the welfare of the mother and baby.

We do not subscribe to the old dictum that a patient must limit her family after the second, third, or fourth cesarean section. As McNally and Fitzpatrick¹⁷ showed, "The capabilities of the uterus after multiple sections have been underestimated." In a survey of 130 patients having four or more cesarean sections, these authors demonstrated that the risk of maternal and fetal mortality was not increased. The term "obstetric cripple" as applied to the patient who has had one or more cesarean sections has now become obsolete.

In regard to unnecessary sections, while many of the patients who are subjected to section might have had successful vaginal deliveries, the decision to perform a cesarean section was based on the probability that the outcome for mother and child would be in doubt. Just as there is an occasional normal appendix or gallbladder removed in order that risk of disastrous results to the patient may be minimized, we consider it much more prudent to perform an occasional borderline section than to procrastinate and gamble against unfortunate results in a case where two lives are involved.

It is sometimes claimed that a cesarean section is performed by the obstetrician because of his lack of dexterity in difficult and complicated vaginal procedures. If this were true, then the patient would be more happily delivered by a cesarean section since, as Thompson¹⁸ has so wisely observed, "One tends to solve difficulties according to the method in which one has the greatest proficiency and with the least risk to the patient." We consider that a well-handled cesarean section is far superior to a mishandled forceps delivery.

The decision to do or not to do a cesarean section should be influenced only by the welfare of the mother and baby. We need a new yardstick for measuring the conditions for which cesarean section should be performed. From the statistics presented above it has been shown that cesarean section as an operative procedure per se is relatively devoid of danger. We feel, therefore, that the teaching of the more liberalized concepts of cesarean section will have the effect of bringing more patients to early and proper care through elimination of this procedure as a last-resort measure. We see no danger in allowing the incidence of cesarean section to seek its proper level. The more frequent use of cesarean section in fetal distress, as advocated by Eastman and Nixon¹² and others, in breech presentations, as advocated by Goethels¹¹ at Boston Lying-in Hospital, in diabetes, as advocated by Black and Miller,¹⁴ and in specific cases of placenta previa and abruptio placentae must of necessity raise the incidence of cesarean section markedly. It will also result in a furtherance rather than a re-

duction of the safeguards for mother and baby and, thus, in a substantial decrease in the over-all maternal and fetal mortality and morbidity.

Summary

In 40,423 consecutive deliveries, there was a maternal mortality of 0.059% and a perinatal mortality of 2.54% in a study made for the years 1952 to 1955 inclusive. In 1,826 elective repeat cesarean sections, there was no maternal mortality and a perinatal mortality of 1.7%.

Indications for cesarean section include previous section, fetopelvic disproportion, uterine bleeding, fetal distress, diabetes, uterine inertia, pelvic pathology, toxemia, and previous uterine myomectomy.

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RECURRENCE OF ASIAN VARIANT INFLUENZA IN THE FAR EAST

REPORT OF 1958 EPIDEMIC IN MARINE CORPS ON OKINAWA

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and
Willard E. Pierce (HMC), U. S. N.

The 1957 influenza pandemic arose in the Far East and spread around the world.¹ This pandemic was caused by a new set of influenza A viruses.² There has been considerable speculation and justifiable apprehension about the possibility of a second world-wide epidemic due to this new Asian variant strain. This is a report of the recurrence in the Far East of influenza proved to be due to the Asian variant strain. This outbreak occurred in August, 1958, among previously vaccinated U. S. Marines stationed on Okinawa.

Materials and Methods

A throat swab specimen in saline solution was collected from 39 of the ill men within 24 hours of the onset of illness. These specimens were heat-sealed in glass ampuls and air-shipped from Okinawa to Taipei in dry ice. Acute blood specimens were taken at the same time. Convalescent blood specimens were obtained on 29 of the men 21 days later. The serum was separated from the blood specimens and shipped to Taipei without refrigeration.

Standard laboratory methods were used for isolation of influenza virus in embryonated eggs and its identification and for antibody studies by hemagglutination-inhibition (HI) and complement-fixation tests.³ The technical methods for the Asian variant strain distributed to interested laboratories by the U. S. Public Health Service's Communicable Disease Center (CDC), Montgomery, Ala., were followed.⁴

Viral antigen and chicken antiserum of strains A/Japan/305/57 (Asian variant), A/Denver/1/57, and B/GL/54 were also obtained from the CDC. The A/Japan/305/57 strain in its egg line was employed as antigen in these studies for both HI and complement-fixation tests. In the complement-fixation test the whole virus antigen was used. For the HI test all serum was pretreated with periodate according to the 15-minute method suggested by the CDC.

Results

Epidemiology.—Only one battalion was involved. Three companies of this battalion returned from a training exercise two days prior to the outbreak.

An outbreak of influenza occurred in August, 1958, among U. S. Marines stationed on Okinawa. The causative virus was studied by standard methods in throat swab specimens collected from 39 of the patients within 24 hours after onset, and a detailed vaccination history was obtained from each patient. Most of the men were afebrile within 24 hours, none had complications, and all were returned to duty after five days. The epidemic had some unusual features, and its source was not discovered, but clinically the cases closely resembled those observed in 1957, and the virus was clearly shown to be a member of the new Asian variant set of influenza A viruses. Almost all of these men had been vaccinated against the Asian variant strain not more than nine months before the epidemic. This epidemic in the Far East emphasized the possibility of a recurrent world-wide outbreak in the coming year.

Their sea voyage had taken them to the Philippine Islands. On the day they returned, a fourth company of this battalion went aboard ship and the fifth and last company of the battalion again stayed in camp. In a 24-hour period, beginning two days after the return to Okinawa, the three companies that had been to the Philippines and the company that had remained in camp had a total of 52 men with febrile illness admitted to the hospital. The amount of cases in each company varied from 2 to 18%. The company that had remained in camp had an intermediate 8% of its men hospitalized. The company that had boarded ship two days before the outbreak experienced no illness that resembled this outbreak, nor was there any outbreak of similar illness among the ship personnel that had transported the men. Other troops that had been aboard ship with the involved companies did not experience illness. After 24 hours, there were no more cases in the involved battalion and no cases occurred in other battalions of the division. No history of similar illness could be found elsewhere on the island in other military units or dependents or in the natives.

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The battalion involved was housed in a recently constructed Quonset hut camp approximately in the center of all activities. Each company had a separate barracks adjacent to each other. A common outdoor toilet served all the companies. The battalion had a

TABLE 1.—Results of Influenza Virus Identification Studies*

Virus Antigen	Prototype Serums		
	A/Denver/1/57	A/Japan/305/57	B/GL/1739/54
A/Denver/1/57	80	0	0
A/Japan/305/57	0	80	0
B/GL/1739/54	0	0	80
18 Es	0	40	0
24 Es	0	40	0
27 Es	0	80	0

* HI tests done with prototype and newly isolated viruses as antigen against prototype antisera. Serums were treated with periodate.

† Inferior numbers refer to egg passage.

common mess. Staff noncommissioned officers had separate quarters and ate separately, although from the same kitchen. The number of noncommissioned officers and Negroes involved in the epidemic was roughly proportionate to their relative numbers in the battalion. No commissioned officers were involved. Although movies were shown in the mess hall in the evenings, many of the men who had been on the sea voyage went into the nearby towns the evenings after returning. No close association between the men from the various companies who became ill could be found.

Clinical Picture.—Similar complaints were presented by all of the patients, with variation in severity. All men reporting with these symptoms, regardless of severity, were hospitalized in order that they might be isolated. The initial symptom was slight coryza, followed by chills or sensations of fever, malaise, headache, and myalgia. Some complained of a cough that aggravated the headache. Physical examination and routine laboratory tests revealed no consistent abnormalities except for fever. The mean admission temperature was 100.4 F (38.5 C) with a range of 99.2 to 104 F (37.2 to 40 C). Treatment consisted of bed rest, forced fluids, aspirin, and cough medication when indicated. Most of the men were afebrile within 24 hours after onset, although a few had recurrent fever during the second evening after admission. The average period of hospitalization was three to four days, with all men being returned to duty after five days. No complications occurred.

Vaccination History.—Detailed vaccination history was available on the 39 patients from whom throat swabs were collected. Thirty-seven of these men had received at least one injection of influenza vaccine containing the Asian variant strain, and 15 had received two injections of such vaccine.

Twenty-eight men received 1 ml. of polyvalent vaccine containing 200 CCA units each of Swine, PR-301, FM1, and Japan/305 strains of influenza A and the Great Lakes 1954 strain of influenza B. Twenty-four of these injections were given in November, 1957, with the rest in either October or December. A total of 23 of the men received monovalent Asian variant vaccine containing 400 CCA units. Twenty-one of these injections were given in February and March, 1958, with the others being given later, the last in May, 1958.

Laboratory Studies.—Three viruses were isolated from the 39 throat swab samples. Identification of these strains as Asian variant influenza A related to A/Japan/305/57 by the HI test with standard antisera is shown in table 1. The isolate 18 was insensitive to nonspecific serum inhibitors and easily identified. The other isolates, 24 and 27, were sensitive to inhibitors, and it was necessary to treat the antisera with periodate to obtain specific reac-

TABLE 2.—Results of HI and Complement-Fixation Tests in Thirty-eight Marines, with Asian Variant Strain of Influenza A Used with Twenty-nine Paired Serums*

Case	HI		Complement-Fixation	
	Acute	Convalescent	Acute	Convalescent
1.....	20	80	16	32
2.....	20	80	16	32
3.....	0	80	0	128
4.....	0	20	8	32
5.....	0	0	0	8
8.....	0	0	16	16
9.....	0	0	8	8
11.....	0	10	32	16
12.....	0	10	0	0
13.....	0	20	8	32
14.....	0	0	16	16
15.....	0	20	16	64
16.....	0	0	0	8
18.....	0	320	64	128
19.....	0	40	0	32
20.....	0	0	0	64
21.....	0	10	32	64
22.....	0	0	16	32
23.....	0	20	8	8
26.....	0	10	8	32
27.....	0	20	8	32
28.....	0	10	8	16
29.....	0	160	32	>256
30.....	0	0	16	64
31.....	0	0	32	32
33.....	0	0	16	32
34.....	0	0	8	32
37.....	0	10	8	32
38.....	0	10	8	16

* A/Japan/305/57 strain used as antigen. In complement-fixation test, whole viral antigen was employed. Results given are reciprocals of original serum dilution; in HI test 0 = <10; in complement-fixation test 0 = <8. All convalescent serums were taken 21 days after acute.

tions. After this treatment there was lower titer inhibition of the new as well as of the standard strains.

Both HI and complement-fixation antibody studies were performed with each of the 29 paired serums, and the results are shown in table 2. A positive

fourfold rise in titer in one or both tests was found in 16 of the serums. The HI test gave positive results 11 times, and the complement-fixation test showed a diagnostic rise 12 times. In addition, a large number of nondiagnostic twofold rises were found. These included seven HI tests with 1:10 titer in the convalescent serum where no inhibition was found in the acute serum at 1:10, the lowest dilution tested. Only four of the paired serums failed to show at least a twofold rise in one of the serologic tests.

It can also be seen in table 2 that only 2 of 29 acute serums showed HI antibodies. Single serum samples were collected from 13 men in the same battalion who were not ill, and 7 showed HI antibodies.

Eleven paired serums were tested by HI with use of isolate 18 (A/Okinawa/18/58) as antigen. The results were similar to those obtained with A/Japan/305/57 used as antigen.

Comment

That a member of the new Asian variant set of influenza A viruses was the cause of this unusual epidemic seems clear. The source of the epidemic is not clear. The recent return of part of the men involved from the Philippines would suggest the possibility of importation of the virus. The incubation period could not have been more than two days, since the men involved were separated until two days prior to the onset.

Influenza epidemics are commonly propagated with person-to-person spread. This outbreak has the characteristics of a common source, single-exposure epidemic. If a common vehicle was involved, it was not discovered. The failure of influenza to spread to contacts is most unusual. The prompt isolation of the cases, such as practiced here, generally fails to prevent propagation of influenza. The immune status of the troops involved may have been responsible for the lack of spread. However, it is difficult to rely on this optimistic view regarding immunity, since the epidemiology of this influenza outbreak is so unusual. Also, the clinical severity in the cases that did occur was not modified from that observed in 1957.

It would appear that, if epidemic influenza due to the Asian variant strain can occur in a group of healthy young adults who had an unusually high risk of exposure to the same agent within the past year and who represent the group in the population which has had the greatest amount of vaccination, then another world-wide epidemic could occur within a year. Past experience would indicate that the sooner such an outbreak would occur the

greater would be the immunizing effect of the 1957 pandemic in limiting the extent and severity of such a recurrence. As this is written in October, 1958, sporadic cases of influenza are occurring in the civilian population in Taiwan. Asian variant influenza A strains have been isolated and identified. This is the first known recurrence of influenza on this island since April-May, 1957.

Summary

In August, 1958, an epidemic of influenza involved 52 U. S. Marines on Okinawa. The three influenza viruses isolated were shown to be closely related to the 1957 strains of Asian variant type A. Serologic evidence of infection with this strain was demonstrated in a significant proportion of the men involved.

Some of the interesting aspects of this epidemic are as follows: Almost all the men involved had received one injection and many had received two injections of influenza vaccine containing the Asian variant strain between six and nine months prior to the epidemic. The clinical illnesses were similar in type and severity to those reported in 1957. Some of the men who became ill had returned by ship from the Philippine Islands two days prior to onset of the outbreak. All the cases occurred within a 24-hour period among the enlisted men of one battalion, with no known spread. This outbreak is significant in regard to the possibility of the Asian variant strain causing a world-wide outbreak during 1958-1959.

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This study was supported, in part, by a contract between the Office of Naval Research and the University of Chicago.

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The opinions and assertions contained herein are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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OPHTHALMIC USE OF NOVOBIOCIN

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Novobiocin is a new antibiotic drug derived from cultures of *Streptomyces niveus* or *S. spheroides*. The majority of gram-positive bacteria are highly susceptible to this antibiotic drug, while gram-negative organisms have a variable susceptibility. Bacterial cross-resistance to novobiocin from use of other antibiotics is not known to exist.¹ Sery and co-workers² concluded from their study with experimental animals that "novobiocin is a useful antibiotic for treating ocular infections involving sensitive bacteria." Finland¹ states that, clinically, novobiocin has been used effectively against infections, particularly those caused by susceptible staphylococci. However, he feels it is best used with another antibiotic to which the organism is also susceptible.

The present study was undertaken to determine the susceptibility to novobiocin of various bacteria isolated from external ocular infections and to determine the effectiveness of novobiocin ointment in the treatment of such infections. (The ophthalmic preparation of this antibiotic is not presently available commercially.)

Methods and Materials

In Vitro Studies.—The sensitivity of 270 strains of bacteria isolated from 264 patients with external eye infections was tested against novobiocin in the following manner: With use of strict aseptic techniques, cultures were taken from the lower conjunctival cul-de-sac of patients having such infections as conjunctivitis, blepharitis, dacryocystitis, corneal ulcer, or socket infection. The cotton swabs were placed in thioglycollate broth and incubated at 37 C for 24 hours. When growth occurred, isolations were made on rabbit-blood brain-heart infusion agar. Then the organisms were streaked heavily on other plates containing the same medium. Paper disks impregnated with 100, 30, and 5 mcg. of novobiocin were placed on the medium 2 cm. apart. Readings for zones of inhibition of growth were made at 6 and 24 hours. The presence of a clear zone around the disk was considered as indicating sensitivity of the organism to the antibiotic drug. Identification of the bacteria was made by standard biochemical tests.

In Vivo Studies.—A total of 30 patients demonstrating various clinical types of external ocular infection were treated with an ointment containing a 1% concentration of novobiocin given every three hours during the day. These infections included 23 cases of acute conjunctivitis, 5 of chronic blepharitis, and 2 of marginal keratitis. Eye cultures were

The sensitivity of 270 strains of bacteria isolated from 264 patients with external eye infections was tested against novobiocin. There were 136 strains of coagulase negative staphylococci, all of which were sensitive to novobiocin; 100% sensitivity was likewise found in 89 strains of coagulase positive staphylococci, 5 strains of diplococcus pneumoniae, and 15 strains of alpha and beta hemolytic streptococci. Varied results were obtained with other organisms, and 13 strains of Pseudomonas aeruginosa were found uniformly resistant. Thirty patients with various clinical types of external ocular infection were treated with an ointment containing 1% novobiocin every three hours during the day. Clinical cure resulted in 28; in the two unsuccessful cases the infection was ascribed to either a fungus or a virus. The effectiveness of novobiocin was demonstrated, but the authors advise limiting its use to the more serious eye infections.

obtained prior to treatment. Patients were requested to return in three to five days, and clinical evaluation of the therapy was made.

Findings

Table 1 shows the novobiocin sensitivity of various bacteria isolated from external infections of the eye. The gram-positive cocci were extremely sensitive to novobiocin. All of the 225 strains of staphylococci were susceptible to this drug. On the other hand, the gram-negative rods showed a variable sensitivity. It is important to note that novobiocin was completely inactive against the 13 strains of *Pseudomonas aeruginosa* and only three of the five strains of *Proteus vulgaris* were sensitive to this drug.

Bacterial isolates from the patients with clinical cases of ocular infection consisted of staphylococci (both coagulase-negative and coagulase-positive) and streptococci. All of these strains were sensitive to novobiocin in vitro. Clinical cure resulted in all but two patients after the use of the drug. In one instance the conjunctivitis was due to *Candida*, and in the other it was probably of viral etiology. Only one patient developed contact dermatitis after the use of novobiocin. This, however, quickly subsided after the discontinuance of the drug therapy.

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Comment

The selection of an antibiotic for use in treatment of eye infections should be guided by a number of factors. Most important, the severity of infection should be classified as "major" or "minor." A major eye infection is one which threatens sight (e. g., corneal ulcer), threatens life (e. g., orbital cellulitis), or may disfigure cosmetically (e. g., eyelid cellulitis). Obviously, major infections warrant the most vigorous and prompt therapy and justify the expense of laboratory studies such as Gram's stain, cultures, and sensitivity determinations. In these cases antibiotic therapy is begun immediately, before culture reports; however, Gram's stain should be done promptly for guidance in antibiotic selection. At present, one of the good indications for ocular use of novobiocin is major eye infection caused by a gram-positive organism. Almost certainly, novobiocin will be effective under these circumstances. Topical and systemic routes of administration should be used simultaneously. The importance of Gram's stain is underscored by the

TABLE 1.—*In Vitro* Sensitivity of Ocular Strains of Bacteria to Novobiocin

Organism	Strains Tested, No.	Susceptible Concentration, Mcg.			Not Susceptible, No.	Susceptible, %
		100	30	5		
<i>Staphylococcus</i>						
Coagulase negative	136	136	136	136	0	100
Coagulase positive	89	89	89	89	0	100
<i>Diplococcus pneumoniae</i>	5	5	5	5	0	100
<i>Hemolytic streptococcus</i>						
Alpha	10	10	10	10	0	100
Beta	5	5	5	5	0	100
Gamma	6	5	2	0	1	83
<i>Proteus vulgaris</i>	5	3	1	0	2	67
<i>Aerobacter aerogenes</i>	6	3	0	0	3	50
<i>Pseudomonas aeruginosa</i>	13	0	0	0	13	0

fact that novobiocin is almost completely ineffective against *Ps. aeruginosa*, a common and virulent gram-negative organism.

Minor infection includes the common, superficial eye infections, such as blepharitis, conjunctivitis, and sty. Since these minor eye infections are relatively harmless and are ordinarily adequately treated by thoughtfully chosen antibacterial drugs, the expense and bother of culture and sensitivity studies are clearly unwarranted, except in unusually persistent and stubborn infections. We do not believe that novobiocin should be used routinely in therapy of minor eye infections.

The known percentage of resistant bacterial strains and the incidence of different bacteria as the cause of ocular infection must be taken into account in the selection of an antibiotic. Table 2 lists the percentage of staphylococcal strains (isolated from patients with eye diseases) which were susceptible to the specified antibiotic.³ It is evident that many strains of staphylococcus were resistant to these antibiotics. Since it has been demonstrated that these organisms will develop resistance to novobiocin, as well as to other antibiotics, we believe

the systemically usable drugs, such as novobiocin, chlortetracycline (Aureomycin), and oxytetracycline (Terramycin), should not be used promiscuously for common, insignificant infections. Such use will inevitably hasten development of the resistant strains which even now are ravaging in nurseries. Not only will use of the drugs suitable for topical use only

TABLE 2.—Antibiotic Sensitivity of Staphylococcal Strains Isolated from 115 Patients with Primary and Secondary Conjunctivitis

Drug	Dosage	Susceptible, %
Nitrofurazone (Furacin)	10 mg.	100.0
Bacitracin	20 units	86.8
Tetracycline	60 mcg.	78.2
Chlortetracycline (Aureomycin)	60 mcg.	76.4
Chloramphenicol	60 mcg.	72.6
Oxytetracycline (Terramycin)	60 mcg.	67.9
Neomycin	60 mcg.	64.8
Dihydrostreptomycin	100 mcg.	63.4
Penicillin	10 units	62.6
Erythromycin	10 mcg.	56.3
Polymyxin B	30 mcg.	7.5

(nitrofurazone [Furacin], sulfacetamide, neomycin, bacitracin, polymyxin B, and others) delay development of bacterial strains resistant to systemic drugs, but these topical drugs actually are more effective against staphylococci. This is because they are less frequently used, and, therefore, the bacterial resistance index is low. Another logical and effective step is the use of combinations of these topical antibiotics, as is often done commercially (e. g., Neosporin, which contains neomycin, bacitracin, and polymyxin B). Table 3 lists the frequency with which the various types of bacteria are found in eye infections.⁴

TABLE 3.—Organisms Found in Patients with Conjunctivitis

Organism	Times Found	
	No.	%*
<i>Staphylococcus pyogenes</i> var. <i>aureus</i>	39	13.0
<i>Staphylococcus pyogenes</i> var. <i>albus</i>	131	43.8
<i>Staphylococcus pyogenes</i> var. <i>albus</i> (hemolytic)	46	15.4
<i>Streptococcus</i>		
Alpha	3	1.0
Beta	18	6.0
Gamma	4	1.3
Gram-negative rods (unidentified)	39	13.0
Diphtheroids	10	3.3
<i>Moraxella lacunata</i>	4	1.3
<i>Escherichia coli</i>	1	0.3
<i>Pseudomonas aeruginosa</i>	3	1.0
<i>Diplococcus pneumoniae</i>	4	1.3
<i>Bacillus subtilis</i>	10	3.3
<i>Hemophilus conjunctivitis</i>	2	0.7
<i>Proteus vulgaris</i>	1	0.3
<i>Neisseria</i>	4	1.3
Inclusion blennorrhoea virus (diagnosed by smear)	6	2.0

* Distribution of organisms in the total number of patients with positive findings.

Novobiocin is well tolerated in amounts of 0.5 Gm. given every six hours. Rashes and other minor reactions are not infrequent, but, otherwise, this antibiotic is relatively nontoxic. Combined therapy of novobiocin with penicillin or tetracycline is reported to have a synergistic effect against bacteria and to delay development of resistant strains.¹

Topically applied to the conjunctiva, novobiocin is irritating in concentrations of 2.5% or above. More than 1 or 2 mg. is not well tolerated on intra-

ocular injections. Novobiocin penetrates the uninjured eye poorly, but effective intraocular levels can be obtained in the presence of corneal epithelial loss or blood aqueous barrier damage.²

The fact that patients with improperly diagnosed and treated cases are occasionally seen clinically prompts us to emphasize the need for accurate differential diagnosis. The red eye in acute glaucoma or acute iritis may be mistaken for an infection—an error which usually has disastrous results. The commonly encountered cases of allergic conjunctivitis will not, of course, respond to antibiotics, much to the patients' annoyance and expense.

Summary

Novobiocin has been demonstrated to be extremely effective against strains of gram-positive organisms isolated from patients with eye disease. Clinical trials substantiate its effectiveness in such infections. Gram-negative organisms respond poorly to novobiocin.

In order to minimize development of resistant organisms, use of novobiocin (and other antibiotics suitable for systemic administration) should be restricted to treatment in the more serious eye infections.

The novobiocin ointment used in this study was supplied as Albamycin ointment by the Upjohn Company, Kalamazoo, Mich.

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PSYCHIATRIC UNIT IN A GENERAL HOSPITAL

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During the past 30 or 40 years a great many changes have occurred in connection with the treatment of the mentally ill. In general, this period marks the development of the dynamic theory and practice in psychiatry, although the Pennsylvania Hospital, which opened in 1752, had a plan of treatment for psychiatric patients in the general hospital, as did New York Hospital, which opened in 1791.¹ Sparked in the beginning by a few individuals, the new ideas and attitudes have gradually been made known to the general public. The force of public opinion, together with continued efforts on the part of individuals interested in the welfare of the mentally ill, has resulted in tangible changes in psychiatric practice.

Among other changes, one having to do with the treatment of hospitalized patients has stimulated increased interest during the past 20 years.² For a long time the accepted treatment of the severely mentally ill patient was hospitalization in closely guarded hospitals, often remotely situated. It appears that such practice was in keeping with the general attitude of the public and the medical profession concerning problems of mental illness. This general attitude was in great part motivated by fear and ignorance, so that with the development

Three years of experience with a newly established psychiatric ward show that there are advantages in having such a facility within a general hospital. This development proceeded without any disturbing influence on the rest of the hospital. The dangers of suicidal or aggressive behavior were met by skillful screening of the patients on admission, by using the therapeutic milieu to control disturbed behavior, and by establishing a day-room where most of the ward activities now occur. Except for Chamberlain screens on the windows, conversion of one bedroom to a security room, and a locked door separating the wing from the rest of the ward, the change was not in architecture but in policy and procedure. Three case histories illustrate the techniques whereby hospital personnel, the patient's family, and the community were woven into a successful therapeutic scheme.

of a psychosis in an individual, with all of the strange and bizarre behavior, it is understandable that such a patient would be carefully hidden away.

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A greater degree of understanding of mental illness has succeeded in changing the older attitude dominated by fear and ignorance. A great many people have learned that mental illness is a matter of degree, that it is no longer considered incurable, and that in fact the prospects for recovery in many cases are excellent.

Along with this gradual development of knowledge and the lessening of fear concerning mental illness there has been increased evidence of willingness to look at the problem. One result of this has been that the mentally ill patient, instead of being hidden away in a remote hospital, has been studied and treated in more accessible surroundings. Specifically, an increasing number of general hospitals have set up psychiatric facilities. Many reports indicate that under these circumstances, where the mentally ill patient is treated in a more open manner, the chances of success for the treatment are greatly increased. World War II provided a considerable impetus for treating psychiatric patients in a general hospital.³ As Brill^{3c} has said, "In contrast to usual practice in civilian hospitals, the Army made provision for the treatment of psychiatric patients in practically all its hospitals" and "in no instance was its presence a disturbing influence on the rest of the hospital." Other authors have corroborated these reports.⁴

This change in the treatment of mentally ill patients has proceeded to the point where it is gaining general recognition and further changes of even greater magnitude appear likely in the future. The report of the Commission on Hospital Care in 1947⁵ recommended, among other things, that "general hospitals should provide facilities and personnel for the diagnosis of mental diseases and for the treatment of those patients who are not in need of long-term institutional care." From 1948 to 1952, the number of general hospitals in the United States with psychiatric facilities rose from 133¹ to over 300.^{4d} In Canada, in 1952, 48% of hospitals had some form of service for psychiatric patients.⁶ Cameron⁷ feels that the establishment of psychiatric units in general hospitals has probably done more to advance psychiatry than any single diagnostic or therapeutic discovery, partly because it has brought psychiatry into intimate contact with the rest of medicine. Juul⁸ notes that "the American Medical Association and the American Hospital Association have indicated that resident programs that do not include inpatient care of emotional disorders may soon be denied full credit and approval."

In addition to the advantages of contact with other branches of medicine and the better facilities for treatment of the general hospital than those of the state mental hospital, there are advantages simply in the general hospital's close proximity to the community.⁹ Castelnuovo-Tedesco¹⁰ states that care of psychiatric patients on open medical and surgical wards, originally dictated by necessity, offers "many advantages over the more customary methods of segregating psychiatric patients from

other types of patients and treating them in a separate setting." In his presidential address at the American Psychiatric Association meeting in May of 1958, Dr. Harry C. Solomon expressed the opinion that mental hospitals as we have known them in the past probably will disappear, at least to a large extent.

Preparation of Psychiatric Unit

This paper is concerned with the experience of developing a psychiatric ward in a University Medical Center setting during the past three years. While there was no provision for an inpatient psychiatric facility originally, it became apparent before the hospital opened that there were advantages in having such a facility. However, since the hospital was already built and extensive reconstruction was not practical, a wing consisting of seven two-bed rooms was placed at our disposal. This set the tone for the ward milieu, since it was impossible to equip the ward for maximum security. This meant that the potentially or actually dangerous psychiatric patients would have to be handled by other techniques than those of architecture. Except for Chamberlain screens on the windows, the conversion of one bedroom to a security room, and a locked door separating the wing from the rest of the ward—a surgical service—no extraordinary precautions were taken. No efforts were made to protect against the possibilities of suicide or aggressive behavior by means of major reconstruction. Mirrors, washstands, bathrooms, glassware, and closets were left the same as throughout the rest of the hospital. Furniture was purchased to make the rooms comfortable. Oxygen outlets counter-sunk in the wall were closed over since they were not necessary, leaving an unbroken wall surface.

We were now ready to open our 10-bed ward. Two beds were lost in converting one bedroom, outside the locked door, to a combined conference-treatment room; two more beds were lost in stripping down one bedroom to bare walls and screened windows (though as fully furnished as necessary) as a security room, to be used only for emergencies with acutely suicidal or homicidal patients.

It was our plan, and we have proceeded thus to the present, to minimize serious accidents in two ways. The first is by choosing patients who, regardless of diagnosis, are not likely to be acutely dangerous, which technique is dependent on the skill of the screening team (first-year resident, social worker, and senior resident). About half our patients are psychotic; the rest suffer from severe neuroses (two-thirds being depressions severe enough to require hospitalization). Of the total admissions less than 10% had to be transferred to another psychiatric facility for longer term treatment (we limit patients' stay to a maximum of 90 days). There has been one genuine suicide attempt on the ward in three years. The patient was discharged over a year ago and has continued in outpatient treatment to the present.

The second method is by controlling whatever disturbed behavior arises by the influence of a therapeutic milieu, created in the main by the residents, nurses, and aides. This despite the fact that our residents were in their first year, our nurses ranged (when we first opened the ward) from almost to wholly inexperienced, and none of our aides had ever worked in a hospital, much less a psychiatric ward, before.

As we prepared to open, we became aware that our program was doomed without one more change. Except for a narrow corridor on which all rooms face, there was no room for patients to stay except in their bedrooms, so two more beds were sacrificed; this room became the day room, where most of the ward activities now occur.

With the ward open we were faced with a considerable problem: how could eight mentally ill patients, living close together for a period of time as a family, with all the stresses and strains that this implies, get the best possible treatment from inexperienced therapists and personnel, on a closed ward with no recreational or therapeutic facilities, in a part of the hospital the remainder of which was given to medical and surgical beds? The solution of this has been gradual, continuing, and progressing, and not only has it served for the treatment of our patients, for the operating of a residency, and for the training of personnel but also it has functioned as a pilot study in preparation for the opening of the Neuropsychiatric Institute, a 186-bed wing of this same general hospital. This latter aspect, the assimilation of a psychiatric unit, originally considered as a foreign body in the healthy tissue of the general hospital, has been successful and has softened the problems to come when the much larger unit is to become an organic part of the hospital. There can also be no question that, in having placed the psychiatric unit within the general hospital, the feeling that psychiatry is part of medicine has been strengthened by the day-to-day experience of the rest of the hospital with our service. The interchange of information and consultations by house staff on ours and on other services created by their working together day and night has made it difficult for the artificial barriers to develop that can so easily occur when the psychiatric service is housed in a separate building.

Therapeutic Milieu

To be a patient in the general hospital then is a major step in ending the painful segregation of the psychiatric patient. The next step is to produce a therapeutic milieu. A beginning to this can be made by having new rooms pleasant and livable; but, without a vigorous activity program in which everyone, personnel and patients alike, participates, the hope of approximating a healthy environment would dissipate.

There has been sufficient interest in a small group of the public to donate money so that it has been possible to get furnishings for the day room, television, radio, phonograph, a small piano, a kiln for ceramic work, and occupational therapy equipment. More important than this has been the contribution of the volunteers, women from the community who have set up a schedule of activities so that patients are busy with enjoyable activities throughout the week. This is not just a matter of filling time, for the patients actively anticipate these activities. One would think, judging from the types of patients on the ward—some of whom are psychotic, some of whom are very withdrawn, some of whom are severely depressed—that such a program would be doomed by the nature of the patients' illnesses. However, starting with the regulation that all patients must participate unless there is a medical contraindication, the patients, on finding that the staff thinks this an important part of their treatment, become intensely involved. In addition, on holidays the volunteers and patients together prepare a party, to which the personnel, the residents, and the faculty of the department of psychiatry are invited.

Beyond this vigorous program on the ward, facilities in the community are used. This is a vital part of the program, for it reinforces the attitude held by all persons working on the ward that the patient should not be given the feeling that he has been isolated because of a dread illness, that he must neither contaminate or be contaminated by the rest of the community. It was this that made us want a ward within the general hospital; it was this that made us fight to maintain psychiatry within the medical center; it was this that provoked us to developing an activities program; it was this that brought the volunteers so much on to the ward; and it is this that makes us use the community as part of the treatment. However, both the patients and the community must be protected. Thus, each patient is carefully screened by a resident and the senior resident to be sure there are no contraindications for his taking part in any particular activity off the ward. Regulations defining degrees of responsibility within the medical center, on the campus, and in the city have been drawn up in great detail, and the physician must write specific orders within these regulations for responsibility. Thus, depending on the specific type of illness, a patient may go accompanied or unaccompanied to art shows, the theater, movies, restaurants, stores, concerts, and selected athletic facilities on the campus and on walks, picnics, trips to the beach, and visits home. Thus the gap between hospital life and community life is lessened and the stigma of mental illness is in large part removed. This extremely careful tailoring of the milieu and the use of community facilities for each

patient produces an essential addition to the armamentarium of psychotherapy, drugs, and other somatic treatment.

For the careful scrutiny of each patient's program, and in addition to the supervision of treatment which each resident gets from the senior staff, there are various conferences in which everyone communicates what he knows of the patient in such a way that a much more complete picture of the patient is obtained by everyone who will be dealing with him. There is a conference of the aides with the senior resident, a conference of the nurses with the chief of the inpatient service and senior resident, and a conference of the volunteers with the senior resident. A milieu conference is attended by everyone on the staff working with the patients in which the over-all manner of dealing with the patients and the milieu in which the patient lives are studied. On this basis changes are made to fit the patient's needs.

Two other techniques are available to us in keeping with our desire to work with the patient in his community. The first, used in all but emergency cases and direct transfers from other wards or hospitals, is the preadmission interview done in the patient's home by the resident and social worker. This permits a much clearer picture of the environment in which the illness arose. The second is that the patient may, at the time of discharge from the ward, continue treatment with the same physician in our out-patient department. This often makes early discharge more feasible. Arrangements for continuing treatment in the outpatient department are made before the patient's discharge. Initial discharge planning actually starts at the time the patient is admitted to the ward. With such a setup, it is also easy for significant members of the family who need treatment to begin work in the outpatient department.

Report of Cases

The following three cases illustrate the successful use of this special environment.

CASE 1.—The patient was a 40-year-old man, a member of the faculty at a local college, who was seen for four months in outpatient psychotherapy because of a depression related to feelings of inadequacy regarding his relationships with his colleagues, his ability to teach, and his ability to write. Prior to his depression he had been a highly competent and respected friend, teacher, and writer and had developed a highly successful career. He was under excessive pressure from his ambitious wife, who felt that his depression was simply due to cowardice. Because of his depression he was doing increasingly poor work and endangering his reputation and his career. Despite psychotherapy and the use of drugs, he became psychotically depressed. He was hospitalized because he was felt to be a severe suicidal risk and because it was feared that he would indeed destroy his career if an end could not be put to the process.

After additional study in the hospital, electroshock was prescribed and started. After a few treatments, the depression began to lift but the patient was realistically concerned lest a long hospitalization be detrimental to his career. When it was clear he was no longer a suicidal risk, he was permitted

to leave the ward for a few hours a day to work. He traveled to his campus where he prepared and delivered lectures, met with his colleagues, and began to write papers again, while still receiving electroshock. The treatment in the hospital continued until the patient's depression lifted. Throughout this period, although he was hospitalized, he had had a break of only a few days in being away from his office, and his work improved so considerably and so rapidly that his career was saved. Had it not been for the opportunity to allow this patient to return to his own community he would, at the least, have been set back considerably in his life's work. Over two years have passed since the patient was hospitalized. He has needed no further hospitalization nor has he been depressed. His career has proceeded beyond his expectations and his productivity has continued to increase.

CASE 2.—The patient was a 36-year-old married composer, who, prior to her admission, had had several episodes during which she wandered aimlessly, apparently out of contact with reality. While in this condition, she was admitted to the psychiatric ward. During the first few days of hospitalization she appeared transiently confused and withdrawn, occasionally overtly anxious, but also at times superficially normal. Psychotic signs—disorientation to time, delusions of electricity coming out of the ceiling, fears she had killed her husband, speech retardation and blocking, distractibility, and poor concentration—were present. Her husband, a composer and teacher as well, dominated the patient both professionally and personally, a relationship analogous to that which she had earlier with her parents.

As intensive psychotherapy brought into focus problems in the patient's relationship with her husband, he was encouraged to visit her and began bringing his lunch on the ward to eat with her. From the start of her treatment, he too began therapy as an outpatient with a member of the staff. In the patient's and her husband's respective therapeutic interviews, not only was the material they brought to the interviews used but also observations which had been made on the ward when they were together were used. The patient's musical abilities were capitalized on by having her start a class in music for the patients. On one occasion when her husband visited, he interfered with her teaching her class; this incident was later used to good advantage in both her and his treatment.

After two weeks of hospitalization, she began visiting at home for increasing periods of time. By the time she was discharged, none of the signs of gross emotional disorder remained. Shortly after discharge, one of the nurses on the ward twice visited with her at home. She continued in treatment as an outpatient with the same physician until sufficiently well to end treatment. The proximity of the hospital to the community in which the patient lived afforded the opportunity early to start visiting at home, without the patient being more than 10 minutes away from the ward or the physician. It also permitted her husband's frequent visits and his easy integration with the treatment program. Information obtained from the nurse's home visits just after discharge helped the therapist obtain a better picture of the home milieu, which information was used in the outpatient treatment to help the patient achieve an understanding of the problems in her home situation.

CASE 3.—The patient was a 50-year-old schoolteacher who was admitted to the psychiatric service as a transfer from neurosurgery two months after receiving a severe cerebral contusion by throwing herself in front of a truck. This suicide attempt occurred after a year of great emotional strain after separation from her husband to whom she had been married for many years. When first seen on our service, she was depressed, agitated, and evasive, with no memory of the suicide attempt. After a period of observation, during which it was the staff's primary task to evaluate the degree of depression and suicidal risk, the patient was started on a course of gradually increasing activities and freedom of movement. Because of artistic interests and ability the patient was

started on a program which included painting, ceramics, piano playing, singing, and play reading. In time she was permitted, at first under supervision and later by herself, to attend plays and concerts and to make trips to museums. This was paced to progress at a slightly faster speed than her depression was lifting or her organic brain syndrome remitting so as to "lead" her away from her psychiatric illness.

From the beginning, her husband was asked to visit with her several times a week; his determination to get a divorce became evident. The two were able to talk freely about this, the patient's attempts to deny his desire for a divorce crumbled but did not increase her depression, since she was guided through this trying period by psychotherapy and by the support of all the personnel and other patients. This permitted her to see this problem more clearly and for the first time begin to plan her future more realistically. Her lawyer spent time with her on the ward, helping her work out details in a straightforward manner rather than the confused approach habitual to her in past years. A conference with school authorities permitted planning whereby the patient was, after discharge, to teach half-time and go to school half-time to work for an advanced degree. She has followed through since discharge and has successfully returned to teaching, is going to school, has weathered the divorce, and has rejoined her friends and taken up the interests of her previous life.

Summary

A psychiatric inpatient treatment facility was developed in a general hospital. It proved that with minimal materials and facilities mentally ill patients can be adequately treated in the general hospital. There is evidence to show that in treating psychiatric patients in this accessible setting the course of the illness is shortened considerably. Where in the past such patients ordinarily would have been sent to remote, poorly staffed hospitals where they would tend to remain for long periods of time, in this situation they remain close to the community and to their own homes. This method of dealing with severe mental illness has been shown to be effective for the patient, and it has the additional advantage of helping to dissipate the fear and ignorance so prevalent in the minds of the healthy members of the community.

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THE PATIENT'S HUSBAND.—Every doctor practicing obstetrics should show consideration to the patient's husband at every possible opportunity. Try to make him feel that he counts for something besides paying the bill. If he accompanies his wife on her first visit to your office, take the few extra minutes required to make his acquaintance instead of ignoring his existence. When he brings his wife to the hospital talk to him in person or over the telephone. Reassure him (put yourself in his position). Find out where he is going to be so you can let him know as soon as the baby is born. Invite him to telephone you for a progress report when the labor is long drawn out instead of allowing him to pester the switchboard operator at the hospital. As soon as the mother is safely in her room, give the glad news to the husband in person or over the telephone. Make sure that he gets to see his wife as soon as possible and, above all, make sure that he sees the baby immediately after he has seen his wife. . . . Much will be gained by talking to the husband as the man, the friend, the father, the valued collaborator, which he surely is.—C. D. Bradley, M.D., A Place for the Husband in Modern Obstetrics, *The Virginia Medical Monthly*, November, 1958.

SCIENTIFIC ADVANCEMENT PROGRAM FOR THE COMMUNITY HOSPITAL

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Progress in patient care may be promoted and sustained in the community hospital through the establishment of a scientific advancement program. Every hospital staff has a nucleus of medical scientists who may serve as a source of energy, enthusiasm, and ideas for this activity. The material that follows includes the background for this idea and some of the methods that have been employed successfully by a community hospital in stimulating scientific activities.

Hospital Case History

No hospital existed when the wounded from George Washington's army were evacuated to a historic eastern city. The sick and wounded were twice succored in hastily improvised quarters. About a hundred years elapsed before a permanent hospital was founded in Bethlehem in 1872. This industrial community was faithfully served by the hospital, which became known for pioneer work in the field of trauma. A succession of expansions has been climaxed by a current program which has increased its patient capacity to more than 500 beds. The population has expanded from a frontier settlement to a city of 80,000 and a metropolitan area of 500,000. Members of the medical staff have been conscientious, conservative, and devoted to their patients and a few physicians have achieved national recognition. An adequate complement of medical and surgical specialists has been available in recent years. Heavy patient loads and demands of family and community life have allowed little time for scientific contributions by members of the medical staff.

Patients have relied on this community hospital to a greater extent each year, and they have been reluctant to travel to distant medical centers. The distribution of special medical talent to this community has enabled the hospital to offer most of the definitive care that was needed. This stay-at-home trend has increased the technical responsibility of this community hospital, and has provided an opportunity for clinical experience that was previously confined to medical teaching centers. Increasing technical demands on the hospital, availability of special medical talent, accumulating clinical experience, and accelerated developments in medical science have created a need for a program to promote local scientific activities.

The Scientific Advancement Committee

A scientific advancement committee was appointed by the medical staff. Some of the most creative and productive physicians were selected

The nucleus of medical scientists existing in every hospital can serve as a valuable source of energy, enthusiasm, and ideas if it is properly organized. The plan here described started with a scientific advancement committee appointed by the medical staff. Its activities have discovered and utilized some neglected resources in the hospital and the community. It has often been in a position to improve existing facilities and services by a constructive approach, so that the negative attitudes engendered by scrutinizing and threatening the physician have been replaced by the positive motivation of scientific activity. This has not only provided an opportunity for clinical experience formerly confined to medical teaching centers but it has also enabled the hospital to offer the definitive care needed by most patients. Many are now reluctant to travel to distant medical centers. Improvement in the scientific climate of the hospital has resulted in improved morale and attitudes, improved patient care, and better community relations.

for the initial group. The chairman was expected to remain in office at least three years. About one-third of the members were scheduled to be changed annually, providing most members of the staff with the opportunity to serve on the committee.

It has been useful to select individuals from many different medical disciplines. Eleven members have been found to be a practical committee complement for a staff that exceeds 100 members. The president and president-elect of the medical staff have been encouraged to attend committee sessions to provide administrative continuity.

It has been advantageous to stage meetings in the relaxed atmosphere of a home. This environment has provoked more creativity, enthusiasm, and spontaneity than was usually experienced in the hospital. Our practice has been to invite committeemen and their wives to an informal buffet supper. The enthusiasm of the women has ensured perfect attendance. Committeemen have moved to another room for their meeting, which has rarely exceeded one hour. Friday has been a most satisfactory night for these sessions, since the group was more relaxed at the end of a work week.

The meeting room was prepared for a formal conference. Seating was arranged around a central table, and the agenda was displayed on a lighted easel. The entire proceedings have been recorded by means of a standard conference recording system. The principal task of the chairman has been to guide the discussion in accordance with the prepared agenda and to make certain that the meeting adjourned on schedule.

Minutes were prepared by listening to the recording and summarizing the discussion on a typewriter. It was surprising to discover many important contributions that were preserved on the recording and yet completely forgotten by all persons who attended the session. Copies of minutes have been distributed to the medical staff, nursing supervisors, hospital administrators, interns and residents, members of the board of trustees, and anyone else in the community who was interested in the scientific activities of the hospital.

Each member of the committee has been expected to execute one or more committee projects. Many of the activities have involved cooperation with other committees of the medical staff. Project assignments were made by letter after each committee meeting.

Meetings have been held quarterly prior to the general staff meeting. This committee has never failed to present an interesting report whenever the medical staff has convened.

Scientific Newsletter

One of the first actions of the committee was to create a quarterly scientific newsletter. News items about individual members of the medical staff were accumulated, edited, and published. Copies of the scientific newsletter were distributed to the medical staff, nursing supervisors, hospital administrators, interns and residents, members of the board of trustees, and other interested persons.

Members of the staff were encouraged to report their interesting cases, and record their attendance at regional, state, national, and international meetings. Personal and professional achievements of individuals were recognized. Publications, addresses, and exhibits by staff members were included. It has been possible to inform recipients of the newsletter about special interests, projects, hobbies, improvisations, and techniques of individual physicians. Occasionally, educational information has been included, such as announcements of basic science courses, discussions of semantics as applied to medicine, and encouragement of physicians to learn a language other than English.

The scientific newsletter has been an important factor in improving the morale of the staff. When all of the scientific activities of the physicians were amassed in a publication, increased staff pride was developed. Attendance at regional, state, national,

and international meetings appeared to increase after the newsletter served as a reminder of such opportunities and responsibilities.

Commendation Program

The scientific advancement committee has monitored the educational programs of the hospital. Whenever a presentation of unusual quality was witnessed, a letter of commendation was sent to the individual concerned. Letters were sent to interns, residents, permanent staff or visitors, whenever their efforts have deserved such recognition.

An annual award presentation day has been staged to recognize the intern and resident staff. All interns and residents were offered the opportunity to prepare a 10-minute paper for presentation before the assembled staff. The medical education committee planned the program and the scientific advancement committee judged the presentations for scientific excellence. Each person who made a presentation received a token monetary prize, and the persons rendering the best scientific papers were presented a slightly more valuable reward.

The committee has adopted the position that there have been too few honors in medicine. They expect that their recognition of those who have offered special effort in medical activities will encourage physicians to improve the quality and quantity of their scientific contributions.

Regional Resources

Every hospital has certain basic facilities useful in medical research, such as the medical library and medical record, pathological, and radiological departments. These basic services were studied by the scientific advancement committee and suggestions have been made to the administrator, medical staff, and board of trustees for their improvement for clinical research purposes.

Additional resources have been discovered in the community. A neighboring university possessed technical specialists, library services, special equipment, and laboratories that may be used by a medical researcher. It will be possible to arrange for one or more graduate students to be assigned to a medical research project whenever an investigation falls within the general interest of the university graduate program.

Community health groups were discovered in possession of funds available to finance research projects. In most communities, about 60% of funds have been forwarded to the state and national components for use in research projects sponsored by medical schools, and only 40% have been retained for use in the community. It is possible that a larger percentage of funds may be retained for local use when our local research program becomes more advanced. This latter arrangement will be of

mutual benefit to donor and recipient since it will be possible to inform the public regarding the usefulness of their contributions through local publicity and annual exhibits of research activities. It has been our experience, in surveying the community resources for scientific projects, that so much encouragement and enthusiasm was encountered that it was necessary to delay further recruitment of resources until specific projects were ready for execution.

Improving Existing Services

The scientific advancement committee has had an unusual opportunity to encourage the improvement of existing facilities and services. In the past, the approach to progress in hospital services has often been a negative attitude. For example, the medical record, audit, and tissue committees have been actively engaged in scrutinizing and threatening the physician to improve his performance. This has been an approach that has been resisted by the medical scientist. Increased scientific activity may provide a positive motive for improving medical records and refining medical care.

Planning New Services

The increasing complexity of medicine has created a pressing need for new facilities and services. New equipment has often been supplied to a physician or group which applied the most pressure. This has led to the purchase of expensive equipment which was infrequently used, while some silent departments have been neglected. It will be possible for the scientific advancement committee to study the present and future needs of the hospital as a whole and assist in the orderly acquisition of new equipment facilities and services through an equitable priority system.

Medical Vocation Program

The need for replacement of physicians and specialists, and recruitment of technicians, nurses, interns, and residents has been an enduring problem. The scientific advancement committee has elected to engage in the recruitment of persons for medical careers. This activity will include encouraging new physicians to practice in the community, acquainting high school students with the hospital, participating in vocational programs in secondary schools and colleges, and interesting candidates for internship and residency training in the scientific program of the hospital.

Scientific Forecast

The committee soon encountered the need for long-range planning. Each department was asked to forecast their future needs, including equipment, educational program, personnel, research program, and services. Physicians were eager to express their

views about the future of their department. These surveys revealed many immediate requirements, such as the replacement of dilapidated instruments and new equipment needed for definitive care of patients. The most important suggestions were thoughtful plans for additional professional personnel, future technical developments, specialized nursing services, and augmented education programs for nurses and physicians. It was suggested that the medical staff study the scope of the professional talent of the hospital and strengthen all departments by recruiting individuals with special scientific interests who would adapt themselves to the community and the hospital program.

The technical services presently available were summarized and recommendations have been made as to projects that would result in better technical care for the patient. It will be possible for the committee to assist the administration in planning an orderly acquisition of new equipment, facilities, and services so that the hospital may keep abreast with advances in medical science.

Our studies have indicated that the modern hospital must consider increased specialization in nursing services. This program will include the operation of a special care unit for the seriously ill, an ambulatory care unit for the patient being studied for diagnostic purposes, and an organized emergency care and postoperative recovery unit. General nursing education will be necessary at the graduate level, and nurse specialists should be trained for service in the medical and surgical specialties.

The community hospital may play an increasingly important role in the training of interns and residents. The distribution of special medical talent has resulted in a dispersal of clinical and pathological material, so that in many instances the trainee has an unusual opportunity for medical study and training in a community hospital. It will be necessary for the community hospital to meet the challenge of increased educational responsibility by developing sound educational and research programs. A scientific advancement committee will be useful in strengthening this effort.

Future Projects

Every member of the committee has made one or more suggestions for scientific activities. The ideas that follow have been seriously considered as committee projects for the future.

It was suggested that a health museum be sponsored as a contribution to the health education of the community. No other public place seemed more appropriate than the hospital for this facility. The general plan was to display both permanent and temporary exhibits on preventive medicine and on anatomic, physiological, pathological, and surgical

subjects. Planned lectures and demonstrations for organized groups may be added at a later date. A private section of the museum may house selected pathological specimens for use in teaching nurses and physicians.

The medical library will require expansion. A full-time librarian should be enlisted to assist physicians in gathering background material for scientific papers. It is possible that this augmented service may be the beginning of a medical editorial department.

A medical photographic department awaits the selection of a suitable site by the administrator. Clinical and pathological material will soon be permanently recorded for use in medical education and clinical research. After the photographic service has been established, it may be possible to consider the addition of a medical artist.

The ultimate goal of the scientific advancement committee will be to establish a department of medical research. The committee has envisaged a modest building, easily accessible to the clinical departments, and managed by a research director. Many special technical facilities, such as cardiac catheterization, electroencephalography, electromyography, medical library, and medical photography may be housed in this building. Ample equipment, opportunity, and space will be provided for research projects by members of the medical staff.

The work of the scientific advancement committee will not cease with the establishment of this research department. It will be necessary for the committee to sustain scientific interest and activity to ensure maximum use of research facilities and make certain that the quality of patient care keeps pace with the advances in medical science.

Results

It has been difficult to measure the results of this scientific advancement program. Improvement in the scientific climate of the hospital has been experienced in the form of improved morale and attitudes. After publication of the scientific newsletter, it was noted that more persons attended scientific meetings and there was less criticism about absences from the community for such activities. Some estimate of the value of the program may be possible in the future by keeping records of the number of research projects completed, papers published, and improvements obtained in hospital facilities and services.

Some aspects of this program have already spread to other community hospitals in neighboring cities. Even if achievement remains in the realm of enhanced morale, improved patient care and better community relations, the scientific advancement committee considers that these results are well worth their effort.

316 W. Broad St.

HEART SURGERY.—The progress of heart surgery was long held back by fear of the heart's intolerance of interference. Billroth's unwise remark in 1883 has often been quoted, that "the surgeon who should attempt to suture a wound of the heart would lose the respect of his colleagues." Only thirteen years later, in 1896, Rehn reported the first successful suture of a heart wound. Since then many hundreds have been thus treated. . . . The superstition which held up progress for so long is well shown by the observations of the great Ambrose Paré who wrote in 1691, "The heart is the chief mansion of the soul, the organ of the vital faculty, the beginning of Life, the fountain of the vital spirits and so consequently the continual nourisher of the vital Heat, the first to live and the last to die." In spite of this almost lyrical description by Paré it is perhaps sad to think that the heart is really none of these things. It is just a pump, and as a pump we must consider it when we plan to operate it. After the superstition of the untouchability of the heart had been shown to be false, progress in cardiac surgery, after a brilliant start, slowed and virtually came to a full stop except for some slight advance during each of the two world wars. The reason for this was that the time was not yet ripe. The thorax was still a difficult field for the surgeon. Between the two great wars intrathoracic techniques expanded quickly, aided by advances in anaesthesia. By the end of the Second World War the stage was set, the actors were ready and the great drama of the rapid unfolding of successful intracardiac surgery began. Within a few years it had become established as a great addition to surgical treatment and is being used more and more. The drama of this somewhat spectacular field of surgery tends to persist even to-day, but it would be a great mistake to allow this and its rapid development to blind us to its essential practical value. Its rapid success rests on its achievements.—Sir R. C. Brock, M.S., F.R.C.S., *The Present Position of Cardiac Surgery, Annals of the Royal College of Surgeons of England*, October, 1958.

CLINICAL NOTES

IPRONIAZID THERAPY OF PSORIASIS

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This short report summarizes our experience with iproniazid (Marsilid) in the treatment of psoriasis vulgaris. The stimulus to this study came from the publications of Morin and Pult,¹ who reported the beneficial effect of iproniazid therapy in 4 patients with psoriasis, and of Sapuppo,² who confirmed this effect in 10 additional patients.

Our interest in this form of therapy was somewhat reinforced by the fact that some physicians and patients connect exacerbations of psoriasis

we prescribed iproniazid we made it our objective to observe its effects on the psyche as well as on the skin.

Sixteen patients with psoriasis are included in the present study. Eleven were ambulatory patients from the private practice of two of us (M. B. S. and V. H. W.) and five were patients of the Veteran's Administration Hospital in Manhattan. These patients constituted a selected group in that they presented typical and chronic psoriatic skin lesions

Data on Patients with Psoriasis on Therapy with Orally Given Iproniazid

Case No.*	Age	Sex	Duration of Psoriasis, Yr.	Dosage Range (Mg./Day)	Period of Maximum Dosage, Days	Total Period of Therapy, Days	Effect on Psoriasis	Side-effects
1	9	F	2½	100-150	7	48	No appreciable effect	None
2	32	F	1½	150	7	7	No improvement	Drowsiness, dizziness
3	61	M	20	150-200	7	14	Questionable slight improvement	Dry mouth, constipation, dizziness
4†	38	M	14	300-400	32	300	Excellent clearing in 2 weeks, maintained on 350 mg., occasional flare-up	None at effective dose of 350 mg.; dry mouth at 400 mg.
5	57	M	43	150-300	14	42	Questionable improvement; improved mental outlook	Tiredness, lethargy
6	56	M	10	150-250	2	16	No response	Nausea, numbness, constipation
7	15	F	4	50-150	35	60	Good clearing, probably due to concomittant local therapy; improvement continued after stopping iproniazid therapy	Dryness of mouth
8	53	M	25	150-250	2	16	No response	Tired, weak, "never felt worse"
9	41	M	17	100-150	42	56	No response	Anorexia, weight loss
10	44	F	15	50-300	62	96	Additional clearing beyond that obtained with hydrocortisone alone; hydrocortisone therapy continued concurrently with iproniazid; relapse 4 weeks after stopping iproniazid therapy	Dizziness; blurred vision; weakness at 300 mg.
11	52	F	6	150-300	3	17	No response	None
12	31	M	12	175-275	14	54	Partial clearing in some lesions at 250 mg. after one week	Vertigo, fainting, nervousness, insomnia, constipation, strangury, impotence
13	56	M	10	125-300	11	63	Partial clearing in some lesions after 15 days at 225 mg.	Nervousness, tremors, vertigo, constipation at 275 mg.
14	69	M	17	150-250	4	26	None	Vertigo, constipation
15	38	M	14	175-250	9	39	None	Vertigo, nervousness
16‡	34	M	12	100-500	7	150	Definite improvement with doses above 250 mg.; the higher the dose, the greater the improvement	Increased appetite, marked gain of weight, strangury, insomnia, nightmares, impotence at higher doses; mental stimulation

* Patients in cases 1 through 11 were private patients and those in cases 12 through 16 were hospital patients.
† Patient in case 4 weighed 320 lb. (145 kg.).
‡ Patient in case 16 weighed 210 lb. (95 kg.).

with psychic and emotional changes and that iproniazid has been reputed to be a psychic energizer or stimulant (antidepressive),³ which would elevate mood, as well as a tranquilizer or psychotomimetic drug in certain patients.^{3b} Because some of our patients with psoriasis also suffered from mood swings and periods of depression, whenever

which had failed to respond satisfactorily to many of the conventional forms of antipsoriatic therapy. All of the patients had extensive involvement of the skin.

Of the 11 patients treated on an ambulatory basis, 5 were women and 6 were men; they ranged in age from 9 to 61 years. The five patients treated at the Veteran's Administration Hospital were all men, 31 to 69 years of age. The duration of the disease prior to therapy with iproniazid varied from 1½ to

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43 years. The table summarizes the results of therapy with iproniazid and includes the side-effects which were encountered.

The initial dosage of iproniazid given to our patients was based on the report of Morin and Pult,¹ who administered 200 to 300 mg. daily. Sapuppo² calculated the daily dose on the basis of 3 to 5 mg. per kilogram of body weight. These authors administered the drug for 4 to 16 weeks without incurring serious or nonreversible side-effects. Our initial dose, therefore, was usually 150 mg. daily, in divided doses, given orally. If no response was evident after one or two weeks at this dosage, and if the drug was tolerated, the dose was increased by 50 mg. every few days until either a satisfactory therapeutic result was achieved or the undesirable effects were such that the drug therapy had to be discontinued. All the undesirable effects, no matter how troublesome or disagreeable to the patients, disappeared with cessation of therapy. When patients had been on therapy with large doses for prolonged periods, the dose was reduced gradually in order to avoid withdrawal symptoms wherever possible.

While patients were receiving iproniazid, they were observed regularly in order to evaluate their response to the drug and to investigate for possible undesirable effects.

Results

Of the 11 ambulatory patients, in one (case 4) the psoriasis cleared completely and remained clear for eight months, when it began to reappear despite continued use of the drug. At 10 months the iproniazid therapy was slowly discontinued while other therapy was instituted. Two other patients improved moderately, although one of them (case 10) had to discontinue therapy because of ill-effects; the other one (case 7) continued to improve even after the iproniazid therapy was discontinued.

Among the five patients of the Veteran's Administration Hospital, one (case 16) showed little improvement when given the smaller doses, but he showed satisfactory improvement of all lesions on therapy with larger doses. Two patients (cases 12 and 13) responded with partial clearing while being given large doses. In all three of these patients the ill-effects were severe enough at the therapeutically effective dosage level to eventually necessitate discontinuation of therapy.

In all patients in whom improvement occurred during iproniazid therapy, it began only when the dose was well above 200 mg., except in one young girl (case 7), aged 15, who responded to therapy with 150 mg. Only one of the patients (case 4), who was extremely obese (320 lb., or 125 kg.) was able to tolerate up to 350 mg. daily without ill-

effects; at 400 mg. a day he noted dryness of the mouth. In no patient was the improvement maintained when the drug therapy was discontinued.

It is noteworthy that, although there were many different ill-effects (see table), only one patient (case 16) experienced stimulation, reporting that he felt as if he were "on a jag"; when the iproniazid dosage was reduced to below 250 mg. daily this patient "came back to what he was before."

Comment

The results obtained from the administration of iproniazid in our small series of 16 patients with widespread chronic psoriasis is discouraging and differs from the findings of Morin and Pult¹ and of Sapuppo,² despite the fact that we administered the drug in dosage both identical to and higher than that of the previous investigators. If iproniazid had none, or even mild, systemic side-effects, it would be worth giving a trial in the attempted management of chronic widespread psoriasis in spite of the fact that in this study only a few patients benefited. However, when this low incidence of favorable responses is considered together with the numerous ill-effects which occurred with the therapeutically effective doses, one is hardly justified in administering iproniazid as a routine form of treatment for psoriasis.

Moreover, since the termination of the present study, reports have appeared concerning serious illness occurring in patients receiving iproniazid therapy for psychiatric disorders. One such article, by Zetzel and Kaplan,⁴ reports the occurrence of liver damage concurrent with iproniazid administration in several patients. These findings are discussed in an editorial in the same issue of the *New England Journal of Medicine*.⁵ Another article, by Frantz,⁶ reports one case of fatal jaundice associated with iproniazid therapy.

The fact that a few patients with psoriasis responded favorably to high doses of iproniazid suggests that further clinical trials may perhaps be warranted with other derivatives of the isonicotinic hydrazide series, with the hope of finding an agent with a better therapeutic index, i. e., one which will yield a greater percentage of patients benefited, with fewer and less troublesome side-effects.

Summary and Conclusions

Iproniazid in relatively large dosage (100 to 500 mg. per day) was administered systemically in the attempted management of 16 patients with generalized psoriasis. The results were disappointing; in only one patient did the psoriasis clear completely, and in four others it cleared but partially during the time they were able to tolerate the drug. The incidence of disagreeable ill-effects was extremely high at the dosage level used in our series. At our dosage level and in our patients with psoriasis we could not observe the reported beneficial effects of

iproniazid as a psychic energizer or mental stimulant or tranquilizer. In only one case was there mental stimulation (at dosage level of over 250 mg. daily); in all other cases any psychic changes noted were in the form of increased fatigue and depression. Perhaps this indicates some fundamental differences between psychiatric patients and those with psoriasis. Fortunately, we encountered no instance of the recently reported hepatic damage from iproniazid. None of the ill-effects in our patients were of serious consequence, and all subsided promptly after discontinuation of therapy. We do not recommend the use of iproniazid for the management of psoriasis but believe that other members of this drug series may be worthy of trial studies.

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ANAPHYLACTIC SHOCK AFTER THERAPY WITH PENICILLINASE

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Penicillinase was first reported by Abraham and Chain in 1940.¹ It was used principally for inhibiting the action of penicillin in culture mediums. In 1956, Becker² reported the use of this substance in destroying penicillin in both guinea pigs and human subjects. Since this report, an increasing number of papers have been published describing the beneficial effects of penicillinase in the treatment of penicillin reactions.³ Toxicity studies have, until the present, failed to reveal any evidence of tissue changes or manifestations of allergic phenomenon from the use of this drug in humans. Untoward reactions after the use of penicillinase have been remarkably mild and infrequent. Zimmerman^{4a} found the drug, when given deep intragluteally, to be nontoxic in 52 patients. He did notice fever in two patients, a morbilliform rash in one, and generalized weakness and malaise of a few minutes duration in another. The intravenous use of penicillinase has been reported to give a slightly higher incidence of this type of reaction.

This case is of interest because it represents an anaphylactic reaction which developed within two minutes after the deep intragluteal administration of 800,000 units of penicillinase (Neutrapen).

Report of a Case

This 50-year-old woman was apparently well until June, 1958, when she developed dyspnea and a pleuritic type pain in the right side of her chest. This pain persisted for several

days, and the dyspnea became more noticeable. The patient was hospitalized in another city, where extensive examination failed to reveal any cause for these complaints.

The patient was seen by me in August, 1958, and she had the same complaints. In addition, she complained of sore throat and a cough productive of a thin yellow sputum. On physical examination, the blood pressure was 140/90 mm. Hg and temperature was 99 F (37.22 C). The posterior pharyngeal wall was inflamed. On auscultation of the chest there were a few sibilant rales in the base of the right lung posteriorly. The remainder of the examination was not contributory. The hemoglobin level was 15 Gm. %, and the white blood cell count was 12,500 per cubic millimeter, with a normal differential. The urinalysis was normal. An electrocardiogram and chest fluoroscopy revealed no abnormalities. The patient was given 600,000 units of procaine penicillin intramuscularly and advised to remain in bed. Six hours later the patient experienced itching between the toes, in the groin, and on the scalp. On examination one hour later, there were large areas of urticaria on the abdomen and thighs. The blood pressure was 140/90 mm. Hg and the pulse rate was 95 beats per minute. Examination of the lungs revealed a few sibilant rales in the base of the right lung. The patient stated that she had obtained some relief from baking powder, and then recalled having had a similar reaction from penicillin several months previous to this reaction.

The patient was given 800,000 units of penicillinase dissolved in 2 cc. of sterile water, intragluteally, care being taken to be certain that the injection was given intramuscularly, and not intravenously. Within two minutes the patient complained of weakness, dizziness, and dimness of vision. Orthopnea, wheezing respiration, and cyanosis was observed to follow. The blood pressure and pulse were not obtainable, and heart sounds were irregular and about 30 to 40 beats per minute.

Then 0.5 cc. of a 1:1,000 aqueous solution of epinephrine (Adrenalin) was given slowly intravenously until the pulse was again obtainable at a rate of 90 beats per minute, and

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the blood pressure was 70/40 mm. Hg. Another 0.5 cc. was given intravenously, slowly, over the next 15 minutes in order to maintain a palpable pulse and obtainable blood pressure. The patient was admitted to hospital 30 minutes later. An electrocardiogram at that time revealed T-wave inversion of leads V₂, V₄, V₅ with a rate of 106 per minute. An intravenous drip of 1 cc. of 1:1,000 solution of epinephrine in 1,000 cc. of 5% dextrose and water was started, and 50 mg. of prednisone (Meticorten) was added to therapy. Oxygen and meperidine (Demerol) hydrochloride, 75 mg., were administered. The blood pressure rose to 120/80 mm. Hg, and the patient appeared to have recovered. The rash and pruritus had disappeared. The urinalysis and blood cell count were not abnormal. An electrocardiogram taken the following morning showed a return of the T waves to normal.

Comment

Penicillinase is a protein enzyme secreted by *Bacillus cereus*, *Escherichia coli*, and many strains of staphylococci. It is thermolabile, with a molecular weight of approximately 50,000. This enzyme functions by hydrolyzing penicillin to the biologically and antigenically inert penicilloic acid. Penicillinase itself is not destroyed or altered by the enzymatic action. It is a foreign protein, and as such, may be responsible for allergic phenomenon. This is particularly true after repeated exposure to penicillinase. No such history could be obtained from this patient. Although no antigen-antibody response has been reported in humans, Fisher and co-workers,⁴ as well as Perlstein and Leibmann⁵ and Housewright and Henry⁶ have reported formation of antibodies after injections of penicillinase in experimental animals.



PENICILLINASE THERAPY—CLINICAL REPORT OF SEVERE REACTIONS

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Penicillinase, an enzyme that destroys penicillin in vivo as well as in vitro, was discovered in 1940. It is produced by bacterial cultures of various strains of staphylococci, *Escherichia coli*, and *Bacillus cereus* and is thought to hydrolyze penicillin to penicilloic acid, which is not antigenic. Becker,¹ Minno and Davis,² and Zimmerman³ have reported it as an effective treatment for patients who react unfavorably to penicillin, but local and febrile reactions to it have occurred.

Minno and Davis² reported that most patients complained of local pain and tenderness at the site of injection; the area frequently remaining painful for 24 hours. Zimmerman³ observed transient soreness at the site of injection in one-third of the patients treated; about one-fifth had severe soreness. He therefore recommended that the injection be

Summary

A severe anaphylactic reaction in a patient followed the injection of penicillinase for penicillin reaction. Although the drug has a definite ability to arrest the antibiotic and antigenic properties of penicillin, it also has its own allergic properties.

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given intragluteally and deeply. In 5% there was an occasional, mild, febrile reaction which lasted a few hours and cleared spontaneously.

Fisher and co-workers⁴ induced the production of antibodies to penicillinase in experimental animals by repeated injections of the enzyme. No allergic reaction to penicillinase has yet been reported in humans, but since it is a protein, frequent repeated exposure might result in the formation of clinically significant quantities of antibodies in a susceptible patient. A nonspecific reaction to protein given parenterally as seen with bacterial vaccine therapy may also occur with penicillinase.

Report of Cases

CASE 1.—A 35-year-old man had an upper respiratory infection for which he received penicillin intramuscularly daily for three days. Eight days later he developed generalized

hives, itching, and arthralgia of the hands, ankles, and knee joints. He was afebrile. He was given 800,000 units of penicillinase in sterile water intravenously, and the same dosage intramuscularly. One hour later he had a severe shaking chill with slight respiratory difficulty and cyanosis. His temperature then rose to 103 F (39.4 C). There was soreness at the site of injection and the urticarial lesions were more numerous.

Adrenocorticotropin, 80 units, was administered intramuscularly and prednisone orally, 30 mg. daily. Within 24 hours the lesions and discomfort began to subside. By the fourth day the patient was free of arthralgia. However he continued to get a few urticarial wheals. Penicillinase, 800,000 units, was again injected intramuscularly without an ensuing febrile reaction. There was considerable swelling of the buttock associated with local pain, persisting for 24 hours. By the 10th day the patient was free of lesions.

CASE 2.—A man, aged 47, was injured June 19, 1957, in a motorcycle accident, sustaining abrasions on the right ankle. He received penicillin intramuscularly. Ten to 12 days later hives developed, for which he was given antihistaminics with little success. The hives became so severe hospitalization was necessary. Under treatment with adrenocorticotropin and prednisone the hives were controlled but when the prednisone was discontinued the hives recurred.

Steroid therapy was continued intermittently until January, 1958, when, penicillinase, 800,000 units, was given intramuscularly in the right deltoid area. There was intense local swelling, erythema, and pain extending from shoulder to elbow. The patient felt lethargic, nauseated, chilly, and his temperature rose to 101 F (38.3 C). For 12 hours he was semicomatose. The urticaria became generalized, more prominent over the area of injection, and was associated with arthralgia for several days.

Ten days later another 800,000 units of penicillinase was injected intragluteally and he again experienced nausea, chills, fever, and lethargy. On this occasion he slept for 30 hours. When last seen in February, 1958, he still had angioneurotic edema of the face.

Comment

Penicillinase inactivates penicillin and thus may reduce reactions to it. However, in view of the severe reactions noted, certain precautions should be observed. In extremely young individuals, debilitated patients, and in the aged who may not tolerate respiratory or cardiac embarrassment, it is advisable that administration of penicillinase be held in abeyance.

104 E. 40th St. (16).

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CANCER OF THE RECTUM IN POOR-RISK PATIENTS.—[One hundred twenty-eight] patients were managed by what are usually considered to be conservative or palliative methods, consisting of fulguration, irradiation (either by radium or by roentgen rays), or local excision, or combinations thereof. Eighty-one of the patients were men and 47 were women. The youngest patient was 32 years old and the oldest was 84 at the time of treatment. When this study was made, 53 of the patients were living and 75 were dead. . . . After exclusion of the 12 patients who were still living but had not reached the end of the statistical 5 year follow-up period, 54 (46 per cent) of the 116 remaining had lived 5 years or more after conservative treatment and 6 had lived 10 years or more. The principal reason for conservative treatment in each case was as follows: senility and general disability in 39 cases, patient's refusal 30, cardiovascular disease 28, metastatic lesions 19, diabetes 3, arthritis 2, cirrhosis of liver 2, alcoholism 1, carcinoma of bladder 1, carcinoma of breast 1, Hodgkin's disease 1, and mediastinal tumor 1. . . . Out of a total of 7 patients who had adenocarcinomas of the rectum graded 3 and were treated conservatively, 3 were living and well at the end of 5 years and 4 were dead. . . . When one considers the morbidity and mortality associated with the radical surgical treatment in certain poor risk patients with carcinoma of the rectum, it seems good clinical judgment to offer them the benefit of conservative treatment. Although this is sometimes spoken of as "palliative treatment," in our opinion, it is curative in more instances than is generally appreciated. That 54 of a series of 116 patients were living more than 5 years after the initial conservative treatment, that 6 were living more than 10 years later, and that 24 of the 75 deaths were unrelated to the rectal carcinoma has led us to believe that many of these poor risk or refusal patients can be salvaged by conservative methods.—J. H. Wittoesch and R. J. Jackman, *Results of Conservative Management of Cancer of the Rectum in Poor Risk Patients, Surgery*, November, 1958.

INVALIDISM ABOLISHED BY TRANSFORMING PAROXYSMAL TO PERMANENT ATRIAL FIBRILLATION

Paul D. White, M.D., Boston

and

George C. Griffith, M.D., Los Angeles

A physician, aged 63 in 1958, consulted one of us (P. D. W.) in November, 1933, because of symptoms of fatigue and a daily precordial ache dating back six months. There was no angina pectoris on effort. Nitroglycerin had no effect on this ache. He had always been well and active and had suffered only mild diphtheria as a child, tonsillitis with tonsillectomy in 1918, mild influenza in 1922, and appendicitis with operation in 1925. He had noted extrasystoles for a few weeks in 1929. His habits included moderate use of tobacco (20 cigarettes a day) and of alcohol and coffee, and overwork with few holidays.

The family history at that time revealed that his mother and one brother were living and well; one brother had died of rheumatic heart disease at 10 years of age and a sister of heart disease at the age of 4. The father died of malignant disease at 65

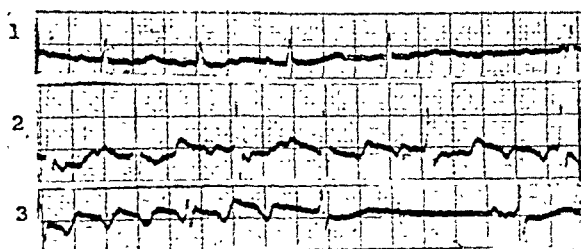


Fig. 1.—Electrocardiogram showing atrial flutter, taken Dec. 12, 1949.

years of age, having had constant atrial fibrillation for eight years before his death. Marital history was normal, with two children living and well.

Physical examination showed no abnormalities whatsoever. The heart was normal in size, sounds, rate (72 per minute), and rhythm. There were no murmurs. There was no evidence of congestive failure. The blood pressure was 120 mm. Hg systolic and 75 diastolic. Fluoroscopic examination showed normal heart size with apparently normal aorta and clear lung fields. By orthodiagram the transverse diameter of the heart measured 10.7 cm. and the internal diameter of the thorax 24.8 cm. The electrocardiogram showed normal rhythm at a rate of 65. The diagnosis was made of "normal heart with a history of former irritability (premature beats) and fatigue."

In February, 1937, after much overwork, paroxysms of tachycardia (at times with absolute arrhythmia) began, lasting one-half hour or so at a rate of about 130. These attacks would occur day or night

and would wake him up. They recurred about 15 times during the next eight months. His general health was otherwise good. He was taking quinine sulfate, 3 grains (0.2 Gm.) at bedtime, which he thought was helpful, and thyroid, $\frac{1}{2}$ to 1 grain (30 to 60 mg.) daily. His blood pressure was found to be low on occasion but at the time of the examination in November, 1937, the pressure measured 115/80 mm. Hg. The heartbeat was regular at a rate of 72 per minute.

From that time in 1937 until 1953, an interval of 16 years, the patient was increasingly beset by frequent paroxysms of atrial flutter or fibrillation requiring much rest and medication until finally attacks recurred five or six times a day lasting from minutes to five or six hours. He became a semi-invalid, feeling very faint during many of the attacks, with very low blood pressure on occasion, dropping to 74/50 mm. Hg in the standing position. Otherwise physical examination was always normal. X-ray films always showed the heart to be normal in size, shape, and position, with clear lung fields. The electrocardiogram was normal between attacks but during the atrial fibrillation, which on occasion changed to flutter, the electrocardiogram showed characteristic atrial and ventricular arrhythmia with essentially normal T waves. When digitalis was administered there was a characteristic depression of the S-T segments. The P-R interval during normal rhythm was within the normal range and the complexes were normal in shape except for the depression of the S-T segments and T waves due to digitalis. The electrocardiogram showing atrial flutter, taken Dec. 12, 1949, is illustrated in fig. 1.

During the few years prior to 1953, much time was spent in the treatment of the frequent paroxysms of the fibrillation and flutter. Digitalis was given in fairly large doses, as was quinidine, for example, 6 grains (0.4 Gm.) every four hours, without benefit. The attacks themselves were terminated by the injection of 500 to 1,000 mg. of procainamide (Pronestyl) and 20 mg. of methoxamine (Vasoxyl) given simultaneously intravenously at a very slow rate. After the abrupt return to normal rhythm, a murmur of aortic insufficiency would occasionally appear and persist for several hours. The blood pressure would rise from a low level of 70/50 mm. Hg to 130/80 on the change from arrhythmia to normal rhythm. Dimenhydrinate (Dramamine), quinacrine (Atabrine), and diphenylhydantoin (Dilantin) were used in successive trials

without benefit. It was necessary for him to remain recumbent on the bed with the head down and the feet elevated on a chair in order to maintain the cerebral circulation during the attacks.

It was finally decided that this distressing situation must be relieved by some more radical measure of therapy and, therefore, in the fall of 1953 the dose of digitalis was increased slowly to 0.6 Gm. of the leaf daily until, by Dec. 28, constant atrial fibrillation began and has continued to date. Figure 2

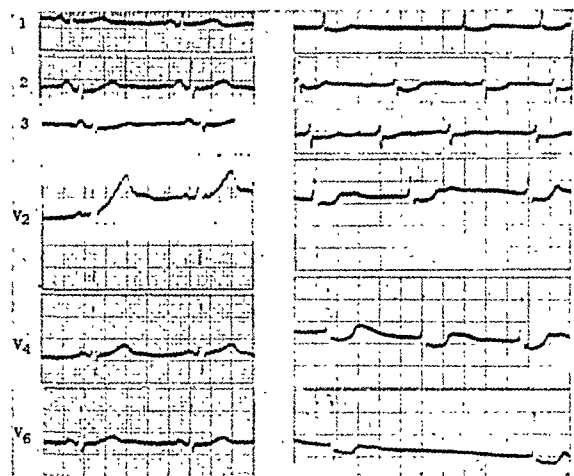


Fig. 2.—Electrocardiograms showing normal rhythm on June 9, 1953 (*left*), and permanent atrial fibrillation on Oct. 28, 1954 (*right*).

shows electrocardiograms of normal rhythm taken on June 9, 1953, between attacks (*left*), and permanent atrial fibrillation taken on Oct. 28, 1954 (*right*).

There has resulted, from this control of the paroxysms of fibrillation through the establishment of permanent fibrillation, an astonishing and tremendous improvement in every way—physical, mental, and spiritual. The heart rate has been well controlled ever since in the 60's and 70's by large doses of digitalis. In January, 1957, $7\frac{1}{2}$ grains (0.5

Gm.) of the powdered leaf was being taken daily, more than five times the average dose, without any gastrointestinal or eye manifestations of toxicity and with a sense of perfect well being. The blood pressure was normal, the heart was not enlarged, and the vital capacity was normal.

Comment

This patient is a most important example of (1) the serious disability which may result from uncontrolled or uncontrollable frequent and exhausting paroxysms of atrial fibrillation or flutter continuing for years, and (2) the remarkable improvement that may come from the establishment of permanent atrial fibrillation with adequate control of the heart rate when enough digitalis is given; in this case it proved to be at least five times the average dose of the medicine taken by individuals who require digitalis constantly. Thus William Withering's original directions published in 1785 that digitalis should be given until it produces an adequate therapeutic effect or toxic symptoms is borne out. Another important feature of this case is that there has been no evidence of structural heart disease at any time nor has the heart muscle been exhausted by the frequent bouts of tachycardia over many years. However, the detriment to the cerebral circulation and to the health, happiness, and usefulness of this man was very evident. We have had experience with a good many other patients of this sort but not with the same degree of disability.

Summary

A case of crippling paroxysms of atrial fibrillation and flutter without structural heart disease, occurred in a physician of middle age with dramatic recovery after the establishment of permanent atrial fibrillation and control of the ventricular rate by massive nontoxic doses of digitalis.

264 Beacon St. (Dr. White).

THE USEFULNESS OF STRESS.—Stress is really an integral part of life. We set our whole pattern of life by our stress end-point. If we hit it exactly, we live dynamic, purposeful, useful, happy lives. If we go over, we break. If we stay too far under, we vegetate. It is the keynote in our whole personality and physiologic development in this competitive society in which we live. Stress is a fundamental factor and one that is very difficult to evaluate in the increasing incidence of hypertensive and coronary disease. I want to talk about stress as a beneficent, therapeutic friend, because I think in some instances, if it isn't used, it is just as dangerous in reverse as we now know bed rest to be. We learned, in the middle of World War II, all of the deconditioning phenomena that come from just putting a person to bed: negative calcium balance, negative nitrogen balance, loss of vitamins, deconditioning of the myocardium—all of the things that now we accept as the sound reason for early ambulation after disease or surgery. But you can't live always up to a stress point, and then on a given day when the magic page of the calendar turns, say, "I'm going to sit and rest and have a good time the rest of my life." You can't do it.—H. A. Rusk, M.D., Stress as a Therapeutic Friend, *The West Virginia Medical Journal*, November, 1958.

THE JOURNAL

OF THE AMERICAN MEDICAL ASSOCIATION



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Subscription price . Fifteen dollars per annum in advance

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CLINICAL JUDGMENT AND COMMON SENSE FOR THE CARDIAC PATIENT

Leonard J. Goldwater, M.D.

I NTEREST in occupational activities for cardiac patients seems to be at an all-time high. Some enthusiastic investigators say that the best way to prevent heart disease is through severe physical exertion; others present evidence that work has a beneficial effect on the course of heart disease. Rehabilitation agencies bombard employers with the slogan "Hire the handicapped—it's good business," and cardiacs are included among the handicapped.

It may be perplexing to some physicians to reconcile such statements with the time-honored regimen of rest and with everyday reports in obituary columns. The question may properly be asked: "What is really known about relationships between occupation and heart disease?"

In 1941, systematic effort to obtain pertinent data was initiated with the establishment of the first cardiac work classification unit at Bellevue Hospital in New York City. At least 50 similar programs are now in operation across the country. Reports emanating from these units, particularly from the one at Bellevue Hospital, provide strong evidence in support of several important conclusions.

Since the number of persons in our population who have heart disease is not known, it is impossible to calculate any rates; nevertheless it is now safe to state that a large proportion of cardiacs can and do work. Many of these will exhibit objective as well as subjective evidence of improvement while in an employed status. Many will have found it possible to return safely to their original jobs after such cardiovascular episodes as a myocardial

infarction, congestive failure, rheumatic activity, auricular fibrillation, or severe anginal attacks. A change in occupation or retraining for a new type of work is not necessary in most cases.

How do physicians judge whether or not a cardiac patient can safely undertake a particular job? The answer is the same as it is to many questions in medicine—by common sense and clinical judgment. There is no mechanical device that will tell the physician what to advise. Important features to be weighed include age, previous occupational activity, etiology of the heart disease, nature of pathological lesion, degree of cardiac reserve, blood pressure, rhythm, chronology of cardiac episodes, and need for and response to therapy. Knowledge of the physical and emotional stress of the patient's job obviously constitutes an indispensable part of the evaluation. Transportation problems and extraoccupational activities cannot be overlooked.

Physicians are well aware of the hazards in prognosticating the course of heart disease, particularly when the coronary arteries are involved. Too often there has been a tendency to "play it safe" by advising severe restriction of physical and mental activity. This may represent the safest or best course for the physician but may not be best for the patient. Statistical evidence is now available to show that the odds strongly favor the physician who advises cardiac patients to resume normal or close-to-normal activity. Clinical judgment, common sense, and courage comprise the key to management of the cardiac patient in relation to employment.

DIGEST OF ACTIONS OF HOUSE OF DELEGATES

A new book entitled "Digest of Official Actions of the American Medical Association House of Delegates—1846 thru 1958" is now ready for publication. It should be of great value as a reference work to all state, county, and local medical societies; all medical school administrative offices and libraries; and such organizations as the Association of American Medical Colleges, American College of Surgeons, American College of Physicians, and American Hospital Association. For members of the House of Delegates of the A. M. A. it will fill a long felt need. The subjects cover a wide range including medical education, hospitals, general practice, legislation, public relations, scientific assembly, World Medical Association, and many others. All policy actions of the House of Delegates are included. To determine the size of the first printing of this important book a special prepublication offer of \$5 per copy is being made. To obtain this volume at that price, orders should be sent at once to the Circulation and Records Department, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

Professor of Occupational Medicine, School of Public Health and Administrative Medicine of the Faculty of Medicine, Columbia University, New York.

ORGANIZATION SECTION

PROCEEDINGS OF THE MINNEAPOLIS MEETING

ABSTRACT OF PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION AT THE CLINICAL MEETING IN MINNEAPOLIS, DEC. 2-5, 1958

The actions of the House of Delegates at the Minneapolis Meeting are abstracted below so that the reader may have this information in digest form. The recommendations of the various Reference Committees as reported in this abstract were adopted by the House of Delegates unless otherwise indicated. The official proceedings are made available in a booklet which was sent to all members of the House of Delegates and officers of the American Medical Association.—ED.

The meeting of the House of Delegates in Minneapolis was called to order on Dec. 2, 1958, with an attendance of 192 delegates out of a possible 198.

Awards and Citations.—Dr. Lonnie A. Coffin of Farmington, Iowa, was named the 1958 General Practitioner of the Year after his selection by a special committee of the Board of Trustees for outstanding community service.

Remarks of the Speaker.—Dr. E. Vincent Askey, Speaker, made several comments relating to the business of the House and recommended that all resolutions be in the hands of the Speaker or the AMA Headquarter's office by noon of the day preceding the opening session of the House; that resolutions presented after that time be considered emergency business and referred to the appropriate reference committee for recommendation to the House.

The Reference Committee on Reports of Officers, to which the remarks of the Speaker were referred, approved in principle the suggestion of the Speaker regarding the introduction of resolutions and recommended that it be referred to the Council on Constitution and Bylaws for implementation. The committee concurred in the Speaker's analysis of the duties of delegates; it commended him for his untiring efforts to facilitate the business of the House of Delegates, for the continuing improvement in materials and procedures to aid the House in its deliberations, and for the dissemination of information and courtesies to alternate delegates.

The Reference Committees as appointed by the Speaker are as follows:

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L. R. PYLE, Kansas
LOUIS W. JONES, Pennsylvania
L. R. DAME, Massachusetts

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L. C. THEOBOLD, New Hampshire
EVERETT P. COLEMAN, Illinois
GEORGE A. EARL, Minnesota

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K. B. CASTLETON, Utah
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DANIEL H. BEE, Pennsylvania

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EARL MALONE, New Mexico
B. J. SULLIVAN, Wyoming
MILO FRITZ, Alaska
EDWARD ROSENOW, California

Sergeants at Arms

C. PAUL WHITE, *Master*, Illinois
EUSTACE A. ALLEN, Georgia
EUGENIO FERNANDEZ-CEJRA, Puerto Rico

Distinguished Guests.—The following distinguished guests were introduced:

Hon. Orville L. Freeman, *Governor of State of Minnesota*
Maj. Gen. Oliver K. Niess, *Surgeon General, Air Force*
Mr. Henry Gregg, *Vice President, American College of Apothecaries*
Mr. Robert E. Abrams, *Executive Secretary, American College of Apothecaries*
Mr. Ray Amberg, *President, American Hospital Association*
Mrs. E. Bruce Underwood, *President, Woman's Auxiliary to the American Medical Association*

In Memoriam.—Dr. Ezra Wolff, *Chairman of the Reference Committee on Rules and Order of Business*, presented the following composite memorial resolution embodying the sentiment of a number of resolutions on the deaths of Dr. Warren W. Fury, Illinois, Dr. James Q. Graves, Louisiana, and Dr. Edward Gans, Montana:

WHEREAS, Several distinguished physicians, Delegates and former Delegates have, since its last meeting, been lost to this House through death, and

WHEREAS, It is fitting that we should officially record our sorrow at their passing, therefore be it

Resolved, That we interrupt our proceedings to stand for a brief moment in silence, as a mark of our respect, as a symbol of the void which their loss has left in this House, in the ranks of Medicine, and in the community, and as a token of the sympathy which we extend to their families and friends, and be it further

Resolved, That the Secretary be instructed to transmit suitable messages of condolence, together with copies of this resolution, to their families.

Address of the President.—Dr. Gunnar Gundersen, *President*, delivered his address, which was referred to the Reference Committee on Reports of Officers. Dr. Gundersen focused his address on major issues confronting the House of Delegates at the Minneapolis Meeting, listing among others (a) the health of the aged, indicating that medicine's programs in this field must be accelerated and given active leadership and implementation on the state and local level; (b) medicine's relations with so-called third parties, urging careful attention and thorough discussion of the report of the A. M. A. Commission on Medical Care Plans by every delegate and interested party; (c) the report of the Committee to Study A. M. A. Objectives and Basic Programs, asking

for a thorough study and discussion of the findings and recommendations presented and pointing out that the action taken by the House would have an important bearing on future emphasis and direction of the Association's scientific, socioeconomic and liaison program; (d) the policy statement on the development of additional facilities for medical education, contained in the report of the Council on Medical Education and Hospitals (see *THE JOURNAL*, Nov. 15, 1958, page 1470), recommending that it receive the enthusiastic support of the entire profession, and that it be made widely known to correct past misinterpretations of the Association's viewpoint concerning the supply of physicians; (e) establishment of A. M. A. organizational pattern, recalling the recommendations of the Heller Report and the Hyland Committee concerning the line of authority of A. M. A. Councils. He believed that in the interest of sound administration, this matter should be reconsidered with a view to establishing an organizational pattern which would be internally consistent and would permit the Board of Trustees, on behalf of the House of Delegates, to provide appropriate supervision over all those activities for which it is now responsible for control of expenditures; (f) the international medical scene, urging that American medicine offer leadership and imagination in this area as a contribution to world understanding.

The Reference Committee stated that with respect to item (a) one clear line of progress was demonstrated by (1) the work of the A. M. A. Committee on Aging which had sponsored in September, 1958, a national planning conference to mobilize and coordinate medical society action in the health care of the aged; (2) the work of the Joint Council to Improve the Health Care of the Aged, and (3) the projected 1961 White House Conference on Aging which has been wholeheartedly supported by the Association. The committee in considering item (b) reiterated the extreme importance of continued study and efforts directed toward third parties involved in medical service. In regard to item (e), the committee indicated that it had heard much testimony regarding the suggestion to reconsider the Hyland Report, but recommended that the Report be not reconsidered at this time; it urged instead maximum liaison between the Board of Trustees and the Councils of the House of Delegates. The committee recommended (item f) expanded interest and support of the Association in the following proposals mentioned in the President's Address: (1) an "International Medical Year"; (2) medical missions; (3) an international medical film library, and (4) the special full support and hospitality to the Second World Conference on Medical Education to be held in Chicago by the World Medical Association next summer.

The Reference Committee stated that Dr. Gundersen set forth a clear line of progress for organized medicine to follow, taking into consideration the traditions for constantly improving the services and activities to meet both the changing needs of the public and the profession, without compromising its principles because of expediency. The committee highly commended the President for his over-all insight into the complex structure and problems of American medicine, and recommended that his untiring efforts on behalf of the medical profession be unanimously acclaimed by the House of Delegates.

Report of Board of Trustees.—The Speaker referred items in the report of the Board of Trustees as printed in the Handbook of the House of Delegates (see *THE JOURNAL*, Oct. 25, 1958, pages 1039-1086) as indicated below:

Reference Committee on Reports of Board of Trustees
Matters Referred by House of Delegates
Distinguished Service Award
Annual and Clinical Meetings
Reorganization

Publications of the A. M. A.
Library
Law Department
Committee on Medicolegal Problems
Division of Councils of Therapy and Research
Bureau of Medical Economic Research
Report of Business Manager
Records and Circulation Department
American Medical Education Foundation

The Reference Committee called particular attention to the excellence of these reports and to the large number and variety of important activities that are carried on daily at the A. M. A. headquarters. The committee indicated that too often the House forgets that what is done in a few hours at a meeting must be implemented over periods of weeks, months and even years. The committee commended the staff for the significant service performed during the periods covered by these reports.

Reference Committee on Hygiene, Public Health, and Industrial Health

Council on Mental Health
Council on Rural Health
Committee on Rehabilitation
Council on Industrial Health
Bureau of Health Education

Council on Mental Health.—The Reference Committee noted publication of the Council's report on Hypnosis in the September 13, 1958, issue of *THE JOURNAL*. The committee again stressed the importance of the alcoholism problem, expressing its approval of the Council's Committee on Alcoholism, particularly in its endeavor to educate the family doctor in the handling of this problem, and recommending wide dissemination of the Manual on Alcoholism. It commended the Committee on Alcoholism for its institutes as well as its exhibits and the service it maintains for physicians through the Classified Abstract Archive of the Alcohol Literature. The committee noted the plans of the new chairman of the Council's Committee on Narcotic Addiction to develop an exhibit on that subject.

The Reference Committee called attention to (a) the Joint Commission on Mental Illness and Health, Inc. which has a variety of studies in progress and plans to complete its work so that its final report may be submitted in the fall of 1959; (b) the planning for the Fifth Annual Conference of Mental Health Representatives of State Medical Associations stating that the report of the Fourth such conference would suggest that the Council is doing an excellent job and commended its activities, and (c) the enlistment of the Woman's Auxiliary at the state level in mental health activities, which has proved helpful in disseminating mental health information. The Reference Committee noted with satisfaction that the Council continues to work with the many other organizations active in the mental health field.

Council on Rural Health.—The Reference Committee endorsed the principles under which the Council works and noted with satisfaction the many activities which the Council is continuously carrying on. During the course of the hearing attention was called to the fact that a certain amount of apathy exists on the part of individual physicians in regard to cooperating with the various rural organizations. The committee recognized the great demand on the time of the individual physician, but nevertheless felt compelled to encourage the members of the Association to cooperate individually with the Farm Bureau, the Grange and similar organizations whenever opportunity and time permit.

Committee on Rehabilitation.—The Reference Committee noted with satisfaction the liaison of the Committee on Rehabilitation with the various other groups concerned with this problem, and endorsed the comprehensive viewpoint of

what constitutes rehabilitation as outlined by this Committee in the August, 1957, issue of *THE JOURNAL* of the American Medical Association.

Council on Industrial Health.—The Reference Committee stated that the report outlined the many activities of the Council, its Congress of Industrial Health, and the activities of its several standing committees. The committee also called attention to continued activity in the survey of union health centers, the preparation of a preliminary guide for measuring work absence due to work illness and injury, and to the reports of the committees which have appeared from time to time in *THE JOURNAL*, and which will be continued. The committee commended the Council on the scope of its activities, indicating that it is serving well in supplying leadership in industrial health matters.

Bureau of Health Education.—The Reference Committee indicated that a great part of this report was concerned with the general problem of health and fitness. The first portion dealt with the activities of the President's Citizens' Advisory Committee on the Fitness of American Youth in which some of the members of the Bureau of Health Education participate. The committee stated that it is desirable that the Bureau continue its interests in this Committee and attempt to direct the activities along acceptable medical lines. It was noted that the Association has on its own for many years interested itself in the field of health and fitness, and has conducted National Conferences on Physicians and Schools. The committee agreed that there is considerable opportunity and need for local leadership by physicians in health and fitness matters, and recommended that physicians individually do what they can to supply this need. The committee called attention to the Bureau's report on its radio and television activities and its cooperation with committees and councils of the Association in disseminating health information via these media. These activities will be transferred in the near future to the new Communications Division.

Reference Committee on Legislation and Public Relations

Committee on Legislation
Washington Office
Department of Public Relations

Committee on Legislation.—The Reference Committee noted with interest the fact that the fifteen bills of a medical nature enacted into law by the 85th Congress, only one was opposed by the Association; that in its statements to Congress the Association supported the legislation or principle involved on nineteen occasions and was in opposition on only six occasions. The committee believed that these facts should be publicized to the American public and to the medical profession in order to help eliminate the charge that the Association is basically negative in its approach to legislative matters.

It noted with disappointment the failure of the Jenkins-Keogh Bills to be enacted by the 85th Congress, especially since passage was so nearly accomplished, and urged the Council on Legislative Activities (formerly the Committee on Legislation) to continue its efforts to secure enactment of this legislation in the forthcoming Congress.

The Reference Committee observed the passage of HR 9822, 85th Congress, providing for state Conferences on Aging culminating in a White House Conference on Aging in 1961, and agreed that reliable information concerning the problems of the aged is needed. It recommended that the House of Delegates urge the constituent medical associations to partake in these conferences to the fullest extent possible.

The Reference Committee complimented the state legislative keymen and urged the continuance of this activity and augmentation of it when necessary in the future; it also thanked the Woman's Auxiliary for its wonderful help in the legislative activities of the A. M. A.

Washington Office.—The Reference Committee noted with interest the report on the Association's Washington Office and hoped that its present reorganization will render its work even more effective.

Department of Public Relations.—The Reference Committee noted with pride the report of the Department of Public Relations, now known as the Communications Division, as it continues and expands its efforts to give both the public and the medical profession a positive, constructive view of the American Medical Association's policies, actions, and services. The program during this one-year period included numerous special projects, designed to achieve particular objectives, in addition to continuing activities aimed at channeling information to the press, television, radio, general public, state and county medical societies, individual physicians, and other organizations.

Reference Committee on Medical Military Affairs

Council on National Defense

Council on National Defense.—The Reference Committee endorsed the work of the Council and was impressed with the increasing scope of its activities in national emergency medical care planning, standby medical disaster programs, proposed mass immunization plans and other activities. The Council has continuously monitored developments in military medical activities, and has taken strong positive action to meet current problems. The recent merger of the Federal Civil Defense Administration and the Office of Defense Mobilization into the Office of Civil and Defense Mobilization was carefully followed by the Council. The delegation of medical and health services to the U. S. Public Health Service and other activities in civil defense have been likewise noted. The committee commended the Council for its sustained medical leadership and recommended that it continue to provide leadership concerning the provision of adequate medical care under disaster, both natural and that induced by enemy action.

Reference Committee on Sections and Section Work

Council on Scientific Assembly

Bureau of Exhibits

Council on Scientific Assembly.—The Reference Committee noted that it is reassuring that the Council is cognizant of the changes taking place in American medicine and has kept pace by holding frequent meetings and conferences during the year. The committee commended the Council for its several meetings with the Section Secretaries, with the Section Representatives and the Section Delegates. Such meetings stimulate interest in the activities of the parent body and aid in the production of worthwhile educational programs. In this connection the committee discussed the desirability of combining programs of two or more of the sections with the possibility of more panel discussions in their joint presentations. It commended this viewpoint to the Council for its consideration bearing in mind the thought that such an approach may aid in eliminating some of the "splintering" within the profession.

The committee called attention to the Council's efforts to bring in as exhibitors the prize winners of the younger group of science students, particularly the National Science Fairs and the Student A. M. A. exhibit.

It also noted and endorsed the request of the Council that more publicity be given to the awards made for Scientific Exhibits by presenting the gold medal winners to the public via television during the inaugural meeting.

A newer and growing part of the Council's activities is within the field of motion pictures and medical television; it was gratifying to learn that the film library has been reorganized. In accordance with the 1957 action of this House seven outstanding foreign-made films have been added to the library.

Bureau of Exhibits.—The Reference Committee noted that as a part of the Council's activities, the Bureau of Exhibits is doing a great service to the membership and through them to the public by making a concerted effort to publicize and distribute health and medical exhibits to several museums and various health fairs throughout the country. They present the doctor and his organization in a most commendable light to the public.

Supplementary Reports of Board of Trustees.—Supplementary reports (A-L) were presented to the House by the Chairman, Dr. Leonard W. Larson:

A. General Practitioner of the Year (see page 599).

B. Poliomyelitis Inoculation Program.—The Board reported that the Association continued its poliomyelitis inoculation and public education program during the past year in cooperation with county and state medical associations, the U. S. Public Health Service, the National Foundation for Infantile Paralysis and the Advertising Council. In spite of the success of this program, it was noted that fifty-four per cent of the population under 40 have not completed their series of inoculations and almost one-third of all children under five have not been inoculated. In the opinion of the Board this situation calls for renewed efforts on the part of county and state medical societies and their member physicians. It recommended that: (1) Each physician assume the responsibility for making certain wherever possible that all members of families he serves receive protection against poliomyelitis by having the full three doses of polio vaccine; (2) State medical organizations arrange with state health departments for a joint effort to bring together county medical society representatives and representatives of county and city health departments for the purpose of discussing the need for joint study committees at the local level to survey the problems which may exist and to work jointly to solve them; (3) County medical societies meet with county and local health department representatives to create study committees to survey the problem of immunization as it may exist in the local area and develop and implement a satisfactory program to meet the local situation.

The Reference Committee on Hygiene, Public Health, and Industrial Health endorsed the report and expressed its opinion that continued activity at all levels directed toward educating the public to secure the minimum of three polio vaccine injections must be continued. It believed that wide dissemination of the recommendations of the Board would be helpful in this regard.

C. Fee Schedule of Bureau of Disability Determinations Under Old Age and Survivors Insurance Program.—At its 1958 annual meeting, the House of Delegates adopted a resolution (no. 23) which recommended that the Association advocate that the schedule of allowances by the Bureau of Disability Determinations be not lower than that adopted for the fee schedule of allowances under the Medicare program in the various states. The Board referred the resolution to its Committee on Medical Rating of Physical Impairment, which called attention to the fact that the Bureau of Disability Determinations, although concerned with the federal BOASI program, is actually a state agency. The resolution, therefore, requests the AMA to seek equalization of the fees paid for professional service by a department of a state agency with the fees paid for professional services under the Medicare program in the states.

The Committee believed therefore that the problem presented in Resolution 23 can and should be resolved at the state level, and that the distribution of this resolution to each constituent association might cause further confusion or create unnecessary problems unless accompanied by lengthy excerpts from reports by this committee on the OASDI program which were published in THE JOURNAL on June 1, 1957, and March 1, 1958.

For these reasons, the Committee on Medical Rating of Physical Impairment recommended to the Board that no action be taken to implement Resolution 23 and the Board concurred in this recommendation.

The Reference Committee on Insurance and Medical Service concurred in the recommendation of the Board. However, the House of Delegates adopted the following amendments to the Reference Committee Report:

"The appropriate committee of the AMA should be empowered to meet with representatives of the B. O. A. S. I. in Washington to develop a method by which each state medical society can reach an agreement directly with the B. O. A. S. I. concerning medical service rendered within each state under this program."

D. Proposed Establishment of State Committees on Rehabilitation.—In March, 1958, the Committee on Rehabilitation sent a questionnaire to each constituent medical association asking whether or not the society had a committee dealing with rehabilitation; it was learned that 24 of the 49 medical societies which responded had no committee. The Board, therefore, urged that each of the constituent medical associations create such a committee and that existing state committees on rehabilitation which limit their activities to liaison with the state Office of Vocational Rehabilitation be urged to expand their activities.

Objectives and guides recommended for the activities of a constituent medical society committee on rehabilitation are:

- (1) The coordination of the rehabilitation interests and activities within the constituent medical society;
- (2) The fostering of medical supervision of rehabilitation services and centers;
- (3) The studying of the problems and interrelationships of the medical, social, educational, and vocational aspects of rehabilitation;
- (4) The informing of the medical professional regarding the availability of information on rehabilitation services;
- (5) The collection of information concerning the establishment of rehabilitation programs, their organization, methods of operation and utilization by physicians and patients;
- (6) The encouragement of county medical society interest, and programs in rehabilitation.

In the process of carrying out this work the constituent medical society committee on rehabilitation might include within its activities the following:

- (a) Review the rehabilitation programs of non-governmental and governmental agencies within the state or territory;
- (b) Encourage the county medical society to (1) review the rehabilitation programs of their local agencies and foundations—including the availability of facilities and services; (2) determine the need for facilities and services, and (3) develop liaison with the various groups in the county and community concerned with rehabilitation;
- (c) Encourage component societies to carry on activities necessary to develop sound rehabilitation services and programs.

The Board recommended that each constituent society urge the component county societies to initiate a survey of rehabilitation facilities within the county and community, and mentioned, as an aid in this activity, the "Guide to Surveying Rehabilitation Services," which can be secured from the Committee on Rehabilitation at AMA headquarters.

The Reference Committee on Hygiene, Public Health, and Industrial Health, considered this report together with the report of the Committee in the Handbook. The Reference Committee endorsed the recommendation that each constituent society establish a committee on rehabilitation to carry out at a local level the activities recommended.

E. Special Division of the AMA.—Resolution 48, introduced by Dr. Donald A. Charnock, California, at the San Francisco meeting in June, 1958, called for the establishment of a new special division of the American Medical Association to deal with the "(a) planning and execution of a long range program of preserving the present system of medical practice and the rights of the individual physician to practice medicine in the manner of his choice; (b) formulation of further plans to meet the medical needs of the American people under the voluntary free enterprise system; and (c) to offer positive advice and assistance to state and local societies as to courses of action to follow as specific threats to voluntary medical care arise in their areas."

In view of the extensive reorganization of the AMA activities already completed, and the plans now under way designed to achieve better coordination of our socio-economic activities, the Board of Trustees felt that the principal objectives of resolution 48 are being realized and that no further action was indicated by the House of Delegates at this time.

The Reference Committee on Reports of Board of Trustees agreed with the Board that the extensive reorganization of AMA activities completed and under way should obviate the necessity for the establishment of such a special division. It therefore recommended that no further action be taken by the House of Delegates in this regard at this time.

F. Admission of Children with Severe Communicable Diseases into United States.—Resolution 51, adopted by the House of Delegates in San Francisco in June, 1958, was referred by the Board to the Committee on Legislation. The resolution pointed out that as adopted children of American citizens, Korean children, some of whom are suffering from communicable diseases including tuberculosis, do not undergo any physical examination or quarantine. The resolution directed the Board of Trustees to petition Congress to amend Section 6 of Public Law 85-316 so as to control, in the interest of public health and welfare, the admission of children with severe communicable diseases into the United States. The Board stated that inquiry has been made of the appropriate offices of government and that action is being taken to resolve this problem.

The Reference Committee on Legislation and Public Relations heard evidence which pointed up the fact that some of these Korean children have tuberculosis which is antibiotic resistant, a fact which increases the seriousness of this public health threat. Therefore, it urged that every effort be made to hasten the implementation of resolution 51 and that this additional fact be brought to the attention of the United States Public Health Service, the State Department, and the Congress by the Board through its Council on Legislative Activities.

G. Progress Report of Joint Committee to Study Paramedical Areas in Relation to Medicine.—The Board submitted with its approval a progress report from the Joint Committee to Study Paramedical Areas in Relation to Medicine (appointed by the Board in July, 1957, to "consider how physician leadership can best be activated in relationships with professional and technical personnel closely related to medicine . . ." and further "to study the matter of liaison at the professional and technical level leading to the above objective").

The committee considers the paramedical areas to be composed of two major groups. One group is made up of individuals who hold advanced degrees, such as Ph.D.'s who are engaged in medical and allied teaching and who also participate directly or indirectly in the care of patients. The second group is comprised chiefly of the technical groups who are engaged in patient care under the more active direction and supervision of physicians.

The committee has established a two-phase study pattern which it considers suitable for its purposes. The initial phase of the study will be directed at those who hold a Doctor of

Philosophy degree. Phase two will be concerned with the paramedical technician-groups, which have less extensive formal academic training and yet are so essential to the total care of the total patient. Conferences with physician and technician groups will be held.

The Committee did not interpret the Board's motion establishing it to infer that this committee should attempt to study the many and varied proposals of certification, licensure, and registration that have beclouded similar studies before. It interpreted the Board's motion to be a sincere effort to improve the quality of medical care in America by bringing together the two often divergent interests that have evolved during the rapid progress in all fields of medical care, and to develop an atmosphere in which all will work harmoniously in the best interest of the patient.

The Reference Committee on Medical Education and Hospitals recommended acceptance of the report from the Joint Committee as information of the Committee's activities and as a report of progress of a continuing study.

H. AMA News Articles.—The Board of Trustees submitted a report regarding the opportunity which has been presented with the advent of the AMA News to publicize in advance important matters being processed for consideration by the House. The Board, after careful consideration, decided to authorize the advance stories on the report of the Commission on Medical Care Plans and of the Committee to Study AMA Objectives and Basic Programs. The Board then explained its thinking and asked the House of Delegates to endorse the point of view expressed. In pursuing this policy, the Board assured the House that every effort would be made to present material factually without editorial slanting of any kind. The objective is not to influence the House, but to promote an informed professional and public opinion.

The Reference Committee on Reports of Board of Trustees summarized the report as a request that the Board of Trustees be authorized to make available to the public and to the profession factual, judiciously-selected information on matters under consideration as well as on those on which definitive action has already been taken.

After careful consideration, the committee concluded that the advantages of the course of action suggested outweigh the disadvantages, and recommended that the House of Delegates concur in the course of action suggested by the Board in its supplementary report.

I. Progress Report of Committee on Amphetamines and Athletes.—The Board indicated that the Committee had anticipated that it would be able to present a final report to the Board at the Minneapolis Meeting. However, in view of the complexity of the program, the Committee recommended that its studies be continued for a period of several months with the expectation that a final report will be provided at the next annual meeting. The Board concurred in this recommendation.

The Reference Committee on Reports of Board of Trustees recommended that the Committee be authorized to continue its studies in the hope that it may be able to submit a final report for consideration at the next annual meeting.

J. Travel Insurance Coverage.—The Board submitted a report indicating that it had made arrangements to secure travel insurance covering the delegates and alternates as well as members of the councils and committees of the House and of the Board while traveling on official business of the Association. Details of coverage and effective dates will be sent to those individuals at a later date.

The Reference Committee on Reports of Board of Trustees stated that it had been informed that the amount of insurance to be obtained was \$25,000 per person and that the cost to the Association in providing this coverage will amount to approximately \$2,500 per year. The committee complimented the Board and recommended approval of its action.

K. Digest of Policy Actions of the House of Delegates.—In June, 1957, in response to a directive adopted by the House of Delegates at its Seattle meeting, the Board reported that it had authorized the preparation of an abstract of all policies of the House of Delegates from 1847 to the present time. The digest has now been completed and is ready for duplication and distribution. The digest, which will comprise 1,024 printed pages, will be available early in 1959 at \$5.00 a copy. Also, to insure continuity, it will be brought up to date at periodic intervals.

The Reference Committee on Reports of Board of Trustees indicated that the Digest will contain an index which will make it convenient for any interested party to trace through the years the policy actions of the Association, and that pre-publication orders will be solicited through THE JOURNAL of the American Medical Association and The AMA News.

The committee commended the Board of Trustees and the headquarters staff for the completion of this assignment, and stated that this material no doubt will be of inestimable value in future deliberations of the House of Delegates and in connection with the day-to-day activities of the personnel of the headquarters staff and the constituent and component medical societies.

L. Administrative Structure of the Association.—The Board of Trustees submitted an informational report outlining several major changes in the administrative structure of the Association. For administrative purposes, the Association's headquarters staff has been divided into the following seven divisions: (1) Business Division; (2) Law Division; (3) Communications Division; (4) Field Service Division; (5) Division of Scientific Publications; (6) Division of Socio-Economic Activities, and (7) Division of Scientific Activities.

The Board indicated that a great deal of consideration had been given to the Association's legislative program; a special committee had been appointed to consult at length with the Committee on Legislation and with all staff personnel involved in legislative activity. A fresh concept of the AMA's legislative activities has been evolved as a result of these lengthy deliberations, i.e., the new program would be composed of three main parts, closely interlocked. The Committee on Legislation was considered an important focal point around which AMA's legislative activities revolve. The Board asked that it assume important new duties in planning overall legislative programs and as part of this added emphasis, changed its name to Council on Legislative Activities. Another key element in the overall legislative program is the new Field Service Division which will be in close contact with the Council on Legislative Activities, its key men, and with state and county medical society headquarters all over the country. AMA's activities in Washington are considered one of the most important components of the overall legislative program, and the office in that city has been reorganized to fit in with the nation-wide program.

The Reference Committee on Reports of Board of Trustees believed that the centralization of responsibility and authority for administration of the affairs of the Association and the reorganization of the headquarters staff into seven divisions as outlined is a long and important step in the right direction. The committee believed also that the proposals with respect to legislative activities are capable of producing valuable results. However, it stated that it must be recognized that any reorganization pattern is doomed to failure unless staffed by competent and loyal people. For this reason and with full understanding of the economic considerations involved, it was the hope of the committee that the Board of Trustees and the Executive Vice President will lend every effort to employ and retain administrative personnel of the highest calibre.

The committee commended the Board and Dr. F. J. L. Blasingame, the Executive Vice President, for the far-sighted approach which they have taken in the formulation of reorganization plans and for the dispatch with which he has placed them into operation.

Statement on Dr. Austin Smith.—The Board of Trustees announced that Dr. Austin Smith tendered his resignation as Editor of THE JOURNAL of the American Medical Association to take effect as of December 15; the Board accepted this with deep regret. The Board expressed to Dr. Smith its sincere admiration for the work which he has done and its earnest conviction that he will continue to contribute effectively to the world of medicine.

The House of Delegates adopted the report of the Board without reference to committee.

Report of Judicial Council.—The Speaker referred the Report of the Judicial Council as printed in the Handbook of the House of Delegates (see THE JOURNAL, Oct. 25, page 1086) to the Reference Committee on Amendments to the Constitution and Bylaws.

The Reference Committee noted that the Council emphasized the autonomy of the county society and the fact that such autonomy imposes responsibilities. If medical societies fail to accept and discharge their obligations in matters of ethics, others will assume these obligations by default. The committee was confident that the "Opinions and Reports" of the Judicial Council relative to the interpretation of the Principles of Medical Ethics will be of invaluable assistance to the component societies in fulfilling these obligations. It felt that the Council aptly summarized its report in these words:

"The Judicial Council urges county and state societies to adopt critical attitudes toward their programs to uphold the honor and dignity of the profession of medicine. These programs must be based on a sound knowledge and understanding of ethical principles. As long as ethical principles are widely and sedulously observed, the reputation of the medical profession will be upheld. The reward will be commensurate with the service rendered in the observation of these ideals. On the other hand, if there is flagrant opinion or careless disregard of ethical principles, the reputation of the profession of medicine will suffer and its responsibilities and obligation will be usurped by others."

Report of Council on Constitution and Bylaws.—The Speaker referred the Report of the Council on Constitution and Bylaws as printed in the Handbook of the House of Delegates (see THE JOURNAL, Oct. 25, page 1117) to the Reference Committee on Amendments to the Constitution and Bylaws.

The Reference Committee stated that as the report was a summation of the year's activities of the Council it required no specific action by the House. The committee, however, wished to commend the Council for its diligent work.

Special Report of Council on Constitution and Bylaws.—The special report was referred by the Speaker to the Reference Committee on Amendments to the Constitution and Bylaws.

New Book on Parliamentary Law.—The Council studied, and was impressed with, a new book entitled "Standard Code of Parliamentary Procedure" by Alice F. Sturgis. The Council did not feel, on the basis of its study alone, however, that the Association should substitute this book for Robert's Rules of Order as a parliamentary guide but urged that officials of the House and constituent and component societies familiarize themselves with this new book.

The Reference Committee reviewed the book and found it to be a complete, concise, simple, acceptable definition of common procedures written by a well qualified authority on parliamentary law. The committee concurred with the Council that various officials should familiarize themselves with this new book so that it may be discussed by the House, if it be so desired, at some future meeting.

Dues Exemption for Resident Physicians.—A resolution introduced at the June, 1958, meeting pointed out the inequity of limiting the dues exempt status of resident to five years after graduation. Many physicians enter residency training

later than five years after graduation and it was felt that they, too, should be entitled to dues exemption during such training period. The House of Delegates agreed with this policy and referred the matter to the Council for implementation. The Council recommended a change in the Bylaws to carry out this policy.

The Reference Committee believed that the Council corrected a gross inequity by providing dues exempt status for residents who return to hospitals for special training five years or more after graduation, and concurred in the recommendation of the Council that Chapter III, Section 4 (C), be amended to read as follows:

"Section 4, Exemption.—The Board of Trustees may excuse the following members from payment of dues, provided they are fully or partially excused from the payment of local dues by their component and constituent associations, except as noted in (D) and (E), and provided the request for exemption is transmitted through the constituent association to the Executive Vice President of the American Medical Association.

"... (C) Interns and resident serving in training programs approved by the Council on Medical Education and Hospitals of the American Medical Association."

Service Members.—At the June, 1958, meeting the Council recommended that Veterans Administration physicians be eliminated from eligibility for Service Membership. This recommendation was not approved by the House and the entire matter of Service Membership was again referred to the Council with the request "that the Council determine some alternative method of determining eligibility for Service Memberships." The Council interpreted the action and discussions of the House as indicating a desire to find some method whereby Service Memberships will be available only to practicing physicians in the various government services who, primarily because of local resident restrictions, are unable to qualify for membership in the component society of their duty station. The Council is continuing to study this over-all problem but recommended adoption of a resolution at this time.

The Reference Committee stated that it was well aware of the many difficulties surrounding the question of Service Membership. It was in agreement with the desire expressed by the House last June that all Service Memberships should be subject to the same eligibility requirements. No distinctions should be made between the physicians in the Armed Forces, Public Health Service or Veterans Administration. The committee sincerely hoped that the Council on Constitution and Bylaws, by further study, would be able to find some method of enabling all physicians desiring American Medical Association membership to obtain such membership through a component society. The committee realized, however, that many component societies have eligibility requirements which make membership by physicians in the Armed Forces, Public Health Service, and Veterans Administration unavailable. This is a situation which only the component society, by the provisions of its own constitution and bylaws, can remedy. In order to call this situation to the attention of the component societies, the Reference Committee enthusiastically approved the suggestion made by the Council on Constitution and Bylaws in its Special Report and recommended the adoption of the following resolution:

"Whereas, It is the policy of the Association as indicated in its Constitution and Bylaws to condition Active Membership upon membership in a constituent association; and

"Whereas, Service Membership is a departure from this principle and should be granted only in unusual circumstances, such as ineligibility for local county society membership; and

"Whereas, It is sometimes impossible for physicians in the Armed Forces, Public Health Service, or Veterans Administration to obtain membership in constituent associations

because of certain component society residence or practice requirements; therefore be it

"Resolved, That the House of Delegates of the American Medical Association urge all component societies to make every effort to provide a type of membership for Armed Forces, Public Health Service, and Veterans Administration physicians which will enable them to become Active Members of constituent societies and of the American Medical Association."

AMA News—Medicorama.—Chapter III, Section 3 of the Bylaws provides for allocating a part of the subscription price of THE JOURNAL of the American Medical Association or one of the nine Special Journals out of AMA dues. The Council recommended that the AMA News and Medicorama publications be placed in the same category.

The Reference Committee believed that since the AMA News has become so popular with the membership, it should be placed in the same category as THE JOURNAL of the American Medical Association, so that it too may be included as a benefit from the payment of dues. The committee was in agreement with the recommendation of the Council and recommended the adoption of the following amendment to the Bylaws:

"Chapter III, Section 3. Dues and Scientific Journals.—Membership dues will include a subscription to THE JOURNAL of the American Medical Association unless a member requests any Scientific Journal published by the American Medical Association in lieu of THE JOURNAL of the American Medical Association. Membership dues will also include subscription to the AMA News."

Board of Trustees.—The Board of Trustees, in order to function more efficiently, recently revised its Standing Rules. In doing so, it found several instances in which those rules would be strengthened if certain changes are made in the Bylaws. The Council considered the changes desired by the Board and was in complete agreement with them.

The Reference Committee considered the changes recommended by the Board and was also in agreement with them. It recommended the adoption of the following amendments to the Bylaws:

A—Amend Chapter XVI, Section 2, to read as follows:

"(A) Immediately following the conclusion of the Annual Session, the Board shall organize by electing a chairman, vice-chairman, secretary and committees necessary to its needs.

"(B) The Board of Trustees, at its organization meeting, by resolution adopted by a majority of Trustees in office, may designate three or more Trustees to constitute an executive committee. The members of the committee shall serve until the next organization meeting of the Board and until their successors are elected and qualified. The executive committee shall have such powers and duties as may be defined from time to time by resolution of the Board of Trustees."

B—Amend Chapter XVI, Section 3 (A), to read:

"(A) There shall be at least four regular meetings of the Board of Trustees each calendar year to be held at such time and place as the Board shall determine. Notice of each regular meeting shall be given at least ten days before each such meeting."

C—Amend Chapter XVI, Section 3 (B), to read:

"(B) Special Meetings may be called at any time by the Chairman or at the request of five members of the Board. Notice shall be given at least five days before each such meeting. The notice shall specify the general purposes of and business to be transacted at the meeting, but other business may also be transacted."

D—Add a new Chapter XVI, Section 3 (C), to read:

"Six trustees shall constitute a quorum."

E—Add a new Chapter XVI, Section 5, entitled "Notice" to read as follows:

"Notice is given, if delivered in person, by telephone, by mail, or telegram. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail, addressed to a Trustee (and other persons entitled to notice) at his address then appearing on the records of the Association, with postage prepaid, and if given by telegraph, shall be deemed delivered when the telegram is delivered to the telegraph company."

F—Add a new Chapter XVI, Section 6, entitled "Waiver of Notice" to read:

"Notice of any meetings and the object or business to be transacted at a meeting of the Board need not be given if waived in writing or by telegraph, cable, or wireless before, during, or after such meeting. Attendance at any meeting shall constitute a waiver of notice of such meeting except where attendance is for the express purpose of objecting to the transacting of any business because the meeting is not lawfully called or convened."

Report of Council on Medical Education and Hospitals.—The Speaker referred the report of the Council on Medical Education and Hospitals as printed in the Handbook of the House of Delegates (see THE JOURNAL, Oct. 25, page 1087) to the Reference Committee on Medical Education and Hospitals.

The Reference Committee expressed approval of the adoption of the document entitled "Functions and Structure of a Modern School of Basic Medical Sciences" as presented in Appendix A, believing that this statement should receive the approval of the medical profession.

The committee called attention to the section of the Annual Report on Medical Education in the United States and Canada, on page 1470 of the Nov. 15 issue of THE JOURNAL which indicates the position of the Council in supporting the development of additional facilities for basic medical education. The committee believed that this statement should receive the approval and support of the entire medical profession, so that it may correct misinterpretations of the Association's viewpoint regarding the supply of physicians and be adopted as the official policy of the American Medical Association as recommended by your President.

The committee recommended approval of the report and appendices of the Council and commended and congratulated the Council and its staff for the outstanding work it accomplished during the period of time encompassed by the report.

Report of the Council on Medical Service.—The report of the Council on Medical Service as printed in the Handbook of the House of Delegates (see THE JOURNAL, Oct. 25, page 1100) was referred by the Speaker to the Reference Committee on Insurance and Medical Service.

The Reference Committee reviewed the report of the Council and its eight committees and stated that if every member of the Association would digest this report there would be sudden death of the oft-repeated criticism that the Association is derelict in proper representation of its membership.

Committee on Aging.—The Reference Committee was cognizant of the completeness of the six-point program that can be used on a national, state, and local level. It noted that regional meetings were held in several states; that an AMA Planning Conference for Medical Society Action in the Field of Aging was held in Chicago in September, 1958; that a Joint Council to Improve the Health Care of the Aged was created and that the Committee on Aging had established liaison with many federal and national groups interested in the problems of the aged. Although the possibility of a flexible retirement program, had been considered by the Committee on Aging, the Reference Committee was of the opinion that the import of this problem is such that it deserves further consideration.

The Reference Committee commended the Committee on Aging for its thorough planning, the progress it has made, and its success in coordinating the medical, federal and state agencies so vital to the success of this program.

Committee on Federal Medical Services.—The Reference Committee commended the Committee on the thoroughness of its work and the excellence of its report and wholeheartedly reaffirmed the policy adopted by the House of Delegates in November, 1956, to the effect that "... Veterans' Administration facilities should be used only for the care of service-connected diseases and disabilities, and that the care of non-service connected conditions should be the responsibility of the individual, or, if he is medically indigent, of his community or state," and that "... until existing law is changed, priority for any non-service-connected care provided should go to those suffering from illnesses or disabilities which are economically catastrophic." The Reference Committee also approved of the resolution adopted by the House in June, 1958, to "... urge Congressional action to restrict hospitalization of veterans in Veterans Administration hospitals to those with service-connected disabilities." The Reference Committee suggested that the Association use every means possible in urging the establishment of, and adherence to, this principle by the Congress and the Veterans Administration.

The Committee approved the recommendation that medical societies at all levels develop committees to assist in guaranteeing VA hospital admissions for (1) service-connected cases, and (2) those cases where an illness constitutes an economic disaster which would justify care by a VA hospital. It urged continued study of the Hometown Medical Care Program for Veterans and suggested that the material derived from the Conference on Federal Medical Services, held on Dec. 1, 1958, be made available to the medical profession as soon as possible.

The Committee called particular attention to the estimation (Handbook, page 247; THE JOURNAL, Oct. 25, page 1105) that by 1986 the service-connected patient load will decrease to 23,600, of which 22,000 will be for psychiatric care, while the non-service connected load will increase to 304,500 if present admission policies are not altered. The committee suggested that each member of the House of Delegates obtain and study a copy of the House of Representatives Committee Print No. 222 for further enlightenment on future implications of the present policy of VA medical care.

It urged strongly that the deleterious effects of the present program upon the economy of the nation be brought to the attention of the Congress forcibly and repeatedly and requested the Board of Trustees to implement this suggested plan.

Committee on Indigent Care.—The Reference Committee called attention to the fact that some states desire the Vendor System of Payment while others do not, claiming that it is a type of socialized medicine. The House of Delegates at its June, 1958, meeting reaffirmed the principle of self-determination by the separate states of the allocation and method of payment of funds. Legislation was passed by the Congress and became effective Oct. 1, 1958, which returns this right to the individual states.

It has been shown that fees to physicians comprise only about ten per cent of the total cost of medical care for indigent patients. The Committee plans to gear its future help to assisting the various states which request assistance. The Reference Committee hoped that the medical profession will be an activating force to provide better liaison between all parties concerned. Physicians in the past have given valuable and untold service to the care of the indigent in their

offices, in clinics, and in hospitals; however, state legislatures should be informed of the needs in establishing sufficient funds to care for the medical needs of the indigent.

The question of division of payments for services has been publicized and reasons have been given for the policies of the Bureau of Public Assistance on this subject. During the year the Committee published a number of detailed reports on this matter in THE JOURNAL.

Home care programs and care of the chronically ill are under careful study by the Committee. The study of these special programs and emphasis on better liaison between state medical societies and state welfare agencies received commendation by the Reference Committee.

Committee on Maternal and Child Care.—The present work of the Committee has been to assist in the organization of activity by medical societies in the field of perinatal care. Specific recommendations to physicians and others dealing directly with the problem are considered in Supplementary Report G (to appear in a future issue of THE JOURNAL).

The Reference Committee commended the work of the Committee on Maternal and Child Care, encouraged its plans, particularly on the county medical society level, and approved its report.

Committee on Medical Care for Industrial Workers.—It was noted that this Committee has carried a heavy burden of work which it has discharged with great skill; that its report which was historical in nature recounted the steps taken by the Committee from the first difficulties encountered by physicians due to alteration of policy by the UMWA Health and Welfare Fund, limiting free choice of physician by its beneficiaries, to the time of the directive to the Board of Trustees to institute a "broad educational program" on the subject of freedom of choice. The Committee was commended on its work.

Committee on Medical and Related Facilities.—The Reference Committee studied this report in detail, with particular interest in the work of the Physicians Placement Service. Of special significance were the tabulations (Handbook, page 273; THE JOURNAL, Oct. 15, page 1113) which indicated that of 2,215 community requests for physicians now on file, 76% are for general practitioners. It was stated that these figures offer mute evidence of the necessity of continued effort on the part of the Committee on Preparation for General Practice.

The Committee urged that the work of the Physicians Placement Service be continued with the recommendation that each state medical association attempt to make available descriptions of location opportunities, and noted with great satisfaction that many states now have in operation such a service which is functioning effectively.

The Reference Committee commended the Committee on Medical and Related Facilities on its work on the Hill-Burton study, the study on the Relationship between Physicians in Private Practice and Those Not in Private Practice, (group practice), and in particular on its preparation of "Recommended Guides and Standards for Medical Care in Nursing Homes."

Committee on Prepayment Medical and Hospital Service.—The Reference Committee noted that this was the final report of this Committee since, in June, 1958, it had been combined with another to form a new committee. Further reference to this subject is contained in Supplementary Report A (to appear in a future issue of THE JOURNAL).

Committee on Relations with Lay-Sponsored Voluntary Health Plans.—The Reference Committee reviewed the report and recommended that it be approved.

(to be continued)

AMERICAN MEDICAL EDUCATION FOUNDATION

Six State Societies Present Checks at Minneapolis Meeting

At a brief ceremony during the opening session of the house of delegates at the Minneapolis Clinical Meeting, AMEF received checks totaling \$248,658.75. Receiving the checks for the foundation was board president, Dr. George F. Lull. The largest gift was from California, presented to Dr. Lull by Dr. Donald Cass of Los Angeles, chairman of his state's delegation. The check for \$150,305.75 represented a gift from every California physician. Dr. Kenneth L. Olson, president of the Indiana Medical Association, delivered a check for \$35,110, representing doctors' initial gifts from Indiana's recently inaugurated dues increase plan.

Other gifts included \$19,608 from New York presented by Dr. Leo E. Gibson of Syracuse, president of the Medical Society of the State of New York; \$25,000 from New Jersey, presented by Dr. William F. Costello of Dover, chairman of the New Jersey delegation; \$9,977.50 from Utah presented by Dr. Kenneth B. Castleton of Salt Lake City, and \$8,657.50 from Arizona, presented by Dr. Jesse D. Hamer of Phoenix. Dr. Lull noted the outstanding record of several of the states. "Three of the North Central states," he said, "have particularly distinguished themselves. Our host state, Minnesota, and

North and South Dakota consistently have raised a high per capita gift. In some cases per capita contributions have even surpassed those of the dues increase states. Their voluntary campaigns provide a model of successful fund raising for medical education."

A. M. A. Presents \$100,000 as 1958 Gift to Foundation

During the final session of the House of Delegates meeting in Minneapolis, it was announced that the A. M. A. Board of Trustees had voted to give \$100,000 to AMEF. The contribution brought the total received at the 12th annual Clinical Meeting to \$348,000.

PHYSICIAN JOINS STAFF OF THE COUNCIL ON DRUGS

Christian Wingard, M.D., joined the A. M. A. Headquarters staff on Feb. 2 as an Assistant Secretary of the Council on Drugs. Dr. Wingard will assist in the operation of the Council's drug evaluation program as well as with the over-all activities of the Council in the field of drug therapy. Formerly, Dr. Wingard was Associate Professor of Pharmacology at the University of Alabama Medical College and School of Dentistry, Birmingham, Ala.

BUREAU OF MEDICAL ECONOMIC RESEARCH

PERSONAL CONSUMPTION EXPENDITURES, 1947-1957 —NEW SERIES VERSUS OLD SERIES

Leonard W. Martin, Ph.D., Chicago

Revisions of its personal consumption expenditures series, made recently by the United States Department of Commerce, are now in press and will appear in a forthcoming National Income Supplement. Since the revisions go back about 11 years, this report, which they triggered, must be twofold in scope. A comparison of the old and revised data to reveal where the impact of the revisions has been greatest will be followed by a review of trends not only to see what they are but how the revisions altered or sustained them. When all the smoke is cleared away it will readily be seen that the consumption of medical care has increased substantially in the last decade. Yet the rises have been

uneven, being great for hospitals and drugs while slight for dentists, physicians, and "all other" medical care. Apparently the demand for physicians' services, in a significant relative sense, has been quite stable for all of the almost 30 years for which data have been made available by the United States Department of Commerce. These data refer to expenditures people make as private consumers, not as taxpayers. They exclude governmental consumption of medical care.

In addition to providing some of the reasons for the revisions, this report will compare the old and new data for 1956 and then review the trends for 1947 through 1957. For these descriptions the three measures traditionally employed in this Bureau's publications on personal consumption expenditures

have been used.¹ When the trends are measured in dollars they reflect inflation and growth. The expression of medical care as a percentage of all personal consumption expenditures, a second measure, provides clues to the presence or absence of increases in demand for some or all of medical care relative to the demand for all want-satisfying goods and services. Finally, the components of medical care can be percentaged for comparison in any one year or for several years through a third measure known as the medical care dollar.

The United States Department of Commerce does more than provide annual estimates of the gross national product, personal consumption expenditures, and other measures of the economy's performance. It periodically makes more exhaustive studies and constantly strives to improve its estimates through the use of newer and additional sources of information. Substantial revisions of personal consumption expenditures and certain other estimates were last made for the period 1952-1953. Their effects on previously published estimates were reviewed by this Bureau in its Bulletin 99.¹ Since the estimates made in 1957 in some cases diverge considerably from those made previously, revised figures will be published from 1946 or 1948 (for the medical care sector) through 1956.

The bases for the revisions are several. The 1954 Census of Business, through its data on retailing, provided a new bench mark for estimates of personal consumption expenditures on drugs. The new bench mark evidently indicated much greater consumption of drugs than had been revealed by the bench mark in the 1948 Census of Business and extrapolations from it. Hence the revision of the series for drugs is based on newer and presumably better data. The revisions of the estimates for expenditures on physicians' and dentists' services were based on tabulations of data from the Internal Revenue Service, particularly for the years 1953 to 1956. Use of such additional data, as will be seen, affected the estimates for dentists more seriously than those for physicians. The hospital expenditures' series was revised to include care in nursing homes, not previously covered. Other medical care components apparently experienced no notable revisions. The effects of these revisions are of interest and concern to all students of medical economics.

More Dollars for Medical Care

The year 1956 was selected for comparing the old series with the revised series for two reasons: it is the latest year for which comparisons can be made and it is the year for which the difference between the two series was greatest. In dollar terms the new series for medical care was 1,942 million dollars higher than the old in that year. Although this difference accounted for 87.5% of the 2,240 million dollars net difference for all personal con-

sumption expenditures in 1956, its magnitude should not be interpreted to mean that upward revisions were made only or almost only in the medical care sector. Some sectors experienced downward revisions; others upward. Recreation, for example, was adjusted upward by 1,317 million dollars. Moreover, in 1955 the upward revision of medical care expenditures accounted for only 52% of the net revision for all personal consumption expenditures.

The dollar figures for the old series, the revised series, and differences between them are presented in table 1 for expenditures on all personal consumption, medical care and its five chief components, and five other areas of personal consumption. Among the particular components of medical care expenditures, the difference in 1956 between the old and the new series was greatest for drugs, 984 million dollars (1,885 million old series and 2,869 million new series). Dentists' services likewise experienced a substantial revision, rising 555 million dollars from 1,070 million, old series, to 1,625 million, new series. For all other components of medical care the upward revision was only 403 million dollars, including 201 million for physicians' services and 67 million for hospitals.

Drugs, Dentists Revised Most

Although dollar measures may be deceptive and may tend to exaggerate differences, the revisions were clearly substantial according to another of the measures commonly employed—percentage of all personal consumption expenditures. In terms of that measure medical care expenditures were revised in 1956 from 4.5% old series to 5.2% new series, as shown in figure 1. A change of 0.7 percentage point may seem small indeed, but it was considerable for a sector which by 1948 had risen only 0.5 percentage point since 1929. In that historic year medical care comprised 3.7% of all personal consumption expenditures; in 1930, 4.0%¹; and in 1948, 4.2%.

The change in percentages between the old and the new series was greatest in 1956 for those components which had experienced the greatest changes in dollar amounts. Thus expenditures on drugs as a percentage of all personal consumption expenditures were revised upward from 0.7 to 1.1%, accounting for 0.4 of the 0.7 percentage point difference between the 4.5 and 5.2% of the old and the new series respectively. Estimates of expenditures on dentists' services rose from 0.4 to 0.6%, providing another 0.2 percentage point; and those on physicians' services rose from 1.2 to 1.3%, accounting for the remaining 0.1 percentage point. Hospitals and "all other" (medical products and appliances used by patients, other professional services, and health and accident insurance) were the two components undergoing no change in the estimates of the two series for 1956 according to this measure.

When the percentaging is limited to the components of medical care expenditures—what we also call the medical care dollar—a different measure results. Such a measure cannot in any way reflect the growth in medical care expenditures, for the sum of the components always equals 100%. When one component grows more rapidly than the others, one or more of the others must decline. In comparing the two series for 1956 by this meas-

Revision of the personal consumption expenditures series has had a very substantial impact upon the medical care sector. By 1956, the last year for which there are two estimates, the new series was 16.0% higher than the old in terms of dollars; the difference between the old and the new as a percentage of all personal consumption expenditures was nearly as great. Since the revisions in 1956 were sharpest for drugs and for dentists' services and

TABLE 1.—Selected Personal Consumption Expenditures: Old Series, Revised Series, and Differences, 1947-1957*
(Millions of Dollars)

Yr., Series (1)	Medical Care						Alcoholic Bever- ages (8)	Tobacco (9)	Ree- reaction (10)	Personal Care (11)	Jewelry (12)	Total, Column (3) Through (12) (13)	Total Personal Con- sumption Expend- itures (14)
	Total Medical Care (2)	Physi- cians' Services (3)	Hos- pitals (4)	Drugs and Sundries (5)	Dentists' Services (6)	All Other Medical Care (7)							
1947													
Old	6,817	2,020	1,397	1,313	784	1,303	8,620	3,869	9,352	2,253	1,463	32,374	164,973
Revised	6,817	2,020	1,397	1,313	784	1,303	8,620	3,869	9,352	2,253	1,463	32,374	165,409
Difference													436
1948													
Old	7,385	2,203	1,591	1,358	833	1,400	7,930	4,147	9,003	2,286	1,435	32,786	177,609
Revised	7,749	2,327	1,621	1,466	900	1,435	7,900	4,155	9,808	2,311	1,436	33,359	178,313
Difference	364	124	30	108	67	35	-30	8	205	25	1	573	704
1949													
Old	7,702	2,312	1,730	1,350	857	1,453	7,730	4,252	9,801	2,259	1,360	33,104	180,598
Revised	8,051	2,338	1,772	1,555	920	1,466	7,680	4,272	10,122	2,324	1,353	33,802	181,158
Difference	349	26	42	205	63	13	-50	20	321	65	-7	698	560
1950													
Old	8,276	2,435	1,975	1,406	869	1,591	7,880	4,401	10,768	2,355	1,385	35,065	194,026
Revised	8,741	2,427	2,037	1,719	961	1,597	7,790	4,432	11,278	2,452	1,370	36,063	195,013
Difference	465	-8	62	313	92	6	-90	31	510	97	-15	998	987
1951													
Old	8,780	2,528	2,167	1,516	888	1,681	8,206	4,701	10,961	2,488	1,477	36,607	203,342
Revised	9,440	2,510	2,248	1,979	997	1,697	8,060	4,743	11,704	2,626	1,465	38,033	209,505
Difference	660	-9	81	463	109	16	-140	42	743	138	-12	1,431	1,463
1952													
Old	9,397	2,676	2,398	1,569	906	1,818	8,785	5,092	11,374	2,573	1,561	38,732	218,328
Revised	10,172	2,657	2,486	2,058	1,098	1,873	8,530	5,153	12,257	2,786	1,577	40,475	219,774
Difference	775	-19	88	489	192	25	-205	61	883	213	16	1,743	1,446
1953													
Old	10,107	2,815	2,635	1,615	943	2,099	8,885	5,310	11,832	2,728	1,560	40,422	230,542
Revised	11,072	2,840	2,729	2,137	1,234	2,132	8,610	5,365	12,892	2,973	1,611	42,523	232,649
Difference	965	25	94	522	291	33	-275	55	1,060	245	51	2,101	2,107
1954													
Old	10,598	2,913	2,852	1,631	975	2,227	8,830	5,228	12,219	2,893	1,606	41,374	236,513
Revised	11,925	3,109	2,962	2,163	1,406	2,285	8,500	5,218	13,256	3,151	1,682	43,732	239,025
Difference	1,327	196	110	532	431	58	-330	-10	1,037	258	76	2,358	1,512
1955													
Old	11,272	3,070	3,130	1,747	1,017	2,308	9,050	5,373	13,034	3,182	1,688	43,599	253,971
Revised	12,827	3,189	3,229	2,473	1,508	2,428	8,700	5,350	14,220	3,399	1,835	46,331	256,940
Difference	1,555	119	99	726	491	120	-350	-23	1,186	217	147	2,732	2,069
1956													
Old	12,106	3,269	3,451	1,855	1,070	2,431	9,360	5,681	13,844	3,581	1,721	46,296	267,160
Revised	14,048	3,470	3,518	2,869	1,625	2,566	8,990	5,638	15,161	3,726	1,920	49,483	269,400
Difference	1,942	201	67	984	555	135	-370	-43	1,317	145	196	3,187	2,240
1957													
Old	Discontinued												
Revised	15,051	3,693	3,884	3,098	1,705	2,671	9,140	6,074	15,908	3,963	1,894	52,030	284,442

* Data from Office of Business Economics, United States Department of Commerce: old series, 1947-1951, National Income; Supplement to the Survey of Current Business, pp. 206-208, 1954; old series, 1952-1956, Survey of Current Business 37:21 (July) 1957; revised series of total personal consumption expenditures, Survey of Current Business 38:5 (July) 1958; revised series of selected items, to be published.

ure, we find that the revision from old to new series was extensive enough so that the percentages for both drugs and dentists rose, while those for the other three components fell. Thus, as a portion of the medical care total, as shown in figure 1, drugs rose from 15.6 to 20.4% and dentists' services from 8.8 to 11.6%. In contrast, physicians' services fell from 27.0 to 24.7%, hospitals from 28.5 to 25.0%, and "all other" from 20.1 to 18.3%. Actually the components retained the same rank with but one exception—drugs moved ahead of "all other," from fourth to third.

occurred largely in them, these two components rose as percentages of the medical care total while the other three components declined.

Difficulties in Measuring Changes

During the past 11 years, medical care expenditures have, like all other expenditures, been subject to the forces of inflation and growth. These characteristics are revealed emphatically by the dollar series from 1947 to 1957, as shown in table 1. Estimated expenditures on medical care measured in dollars have risen year after year. According to

the revised series these expenditures were slightly more than twice as great in 1957 (15,051 million dollars) as in 1947 (6,817 million dollars); their magnitude in 1956 according to the old series (12,106 million dollars) was a little less than double that of 1947 (6,817 million dollars). Since the price index for medical care and drugs rose less than 50% between 1947 and 1957, it follows that there was a genuine increase in real consumption of medical care between 1947 and 1957. In these respects, however, the behavior of medical care expenditures was similar to that for all personal consumption expenditures. Since all dollar series for these years were influenced by the combination of growth and inflation we have been experiencing, it is difficult to separate the growth from the inflation and to relate the growth in medical care to that for all private consumption.

There are distinct advantages to measuring medical care expenditures as a percentage of all personal consumption expenditures. In this way the inflationary forces influencing the dollar values for both medical and all expenditures are largely cancelled out. Moreover, it is extremely important to know which among the various sectors of consumption are growing and which are declining relative to others. In this way we can tell how consumers shift their demands from those areas

The behavior of medical care and its chief components as percentages of all personal consumption expenditures is traced for both the old and the new series for three selected years in figure 2 (see table 2 also). Two relationships are emphasized in this chart—the differences between the old and the new

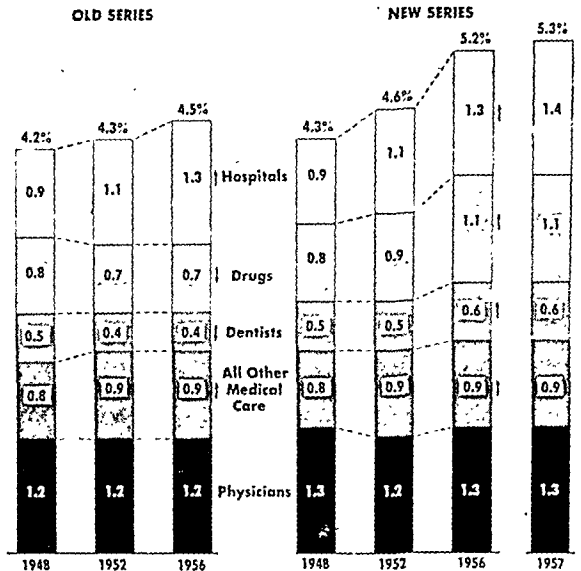


Fig. 2.—Some comparisons of old series with new series for 1948, 1952, and 1956; medical care expenditures as percentage of personal consumption expenditures (data from Office of Business Economics, U. S. Department of Commerce).

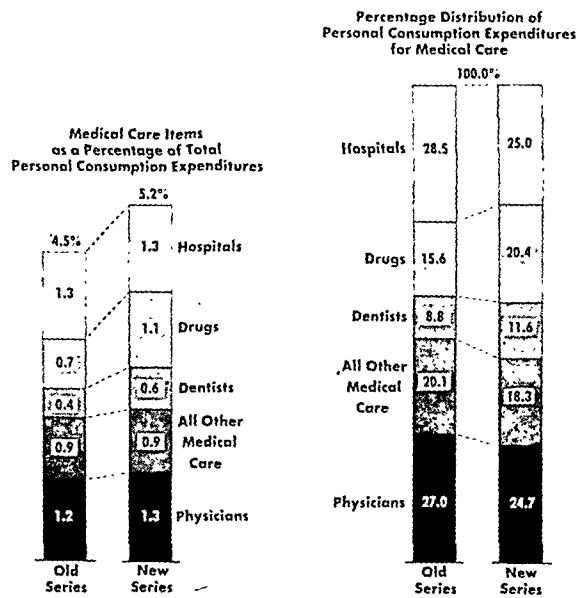


Fig. 1.—Some comparisons of old series with new series for 1956 (data from Office of Business Economics, U. S. Department of Commerce).

declining as a portion of all consumption expenditures to those growing in this sense. This measure, percentage of all personal consumption expenditures, contributes much toward the attainment of these ends.

series and the rise between 1948 and 1957. Since medical care rose as a percentage of all personal consumption expenditures from 4.1% in 1947 (4.2% in 1948) to 5.3% in 1957, in a period when all consumption was rising, its increase was truly substantial. Among the medical care components expenditures for hospital services displayed the greatest rise during this period. The differences between the old and the new series, however, as noted above, were most substantial for drugs and for dentists' services. Expenditures for hospital services differed not at all between the old and the new series for this measure but accounted for one-half the rise from 4.1% to 5.3% that occurred between 1947 and 1957. Expenditures on drugs and dentists' services amounted to six-sevenths of the difference between the old (4.5%) and the new (5.2%) series in 1956, as already mentioned, but contributed only one-third of the rise in medical care expenditures as a percentage of personal consumption expenditures during the last 11 years.

Hospitals and Drugs Lead Rise

Hospitals.—The 1947 data for medical care were the same for both the old and the new series; they were slightly below both the old and the new for 1948. The 0.1 percentage point rise between 1947 and 1948 for the old series (table 2) was accounted for by hospitals' expenditures. These expenditures,

however, as a percentage of all personal consumption expenditures were the same for the old and for the new series in 1948, 1952, and 1956. Thus, as has been mentioned, they played no role in the 0.7 percentage point difference between the old (4.5%) and the new estimates (5.2%) for medical care in 1956. Yet, over the years, the 0.1 percentage point rise from 1947 to 1948, was continued with another 0.2 from 1948 to 1952, 0.2 more from 1952 to 1956, and a further 0.1 from 1956 to 1957. Thus this component rose 0.4 percentage point from 0.9% in 1948 to 1.3% in 1956 by either series and 0.6 percentage point from 0.8% in 1947 to 1.4% in 1957. As a percentage of all personal consumption expendi-

a rising factor from 0.8 to 1.1%. Even more important than the change in quantities is the change in direction of this component from a declining to a rising portion of all personal consumption expenditures, indicating a shift in demand toward rather than from this sector of consumption. Estimated quantities, though subject to some margin of error, are usually expected to show direction of movement correctly. When a revision alters the direction it is considered drastic. Nevertheless the magnitude of the revision—from 0.7% to 1.1%—is itself important, for it contributed four-sevenths of the difference between 4.5% and 5.2% in the two series for 1956. The rise from 0.8% in 1947 to 1.1%

TABLE 2.—Selected Personal Consumption Expenditures as Percentages of Total Personal Consumption Expenditures: Old and Revised Series, 1947-1957*

Yr., Series (1)	Medical Care											Total Columns (3) Through (13)
	Total Medical Care (2)	Physi- cians' Services (3)	Hos- pitals (4)	Drugs and Sundries (5)	Dentists' Services (6)	All Other Medical Care (7)	Alcoholle Bev- erages (8)	Tobacco (9)	Rec- reation (10)	Personal Care (11)	Jewelry (12)	
1947												
Old	4.1	1.2	0.8	0.8	0.5	0.8	5.2	2.3	5.7	1.4	0.9	19.6
Revised	4.1	1.2	0.8	0.8	0.5	0.8	5.2	2.3	5.7	1.4	0.9	19.6
1948												
Old	4.2	1.2	0.9	0.8	0.5	0.8	4.5	2.3	5.4	1.3	0.8	18.5
Revised	4.3	1.3	0.9	0.8	0.5	0.8	4.4	2.3	5.5	1.3	0.8	18.7
1949												
Old	4.3	1.3	1.0	0.7	0.5	0.8	4.3	2.4	5.4	1.3	0.8	18.3
Revised	4.4	1.3	1.0	0.9	0.5	0.8	4.2	2.4	5.6	1.3	0.7	18.7
1950												
Old	4.3	1.3	1.0	0.7	0.4	0.8	4.1	2.3	5.5	1.2	0.7	18.1
Revised	4.5	1.2	1.0	0.9	0.5	0.8	4.0	2.3	5.8	1.3	0.7	18.5
1951												
Old	4.2	1.2	1.0	0.7	0.4	0.8	3.9	2.3	5.3	1.2	0.7	17.6
Revised	4.5	1.2	1.1	0.9	0.5	0.8	3.8	2.3	5.6	1.3	0.7	18.1
1952												
Old	4.3	1.2	1.1	0.7	0.4	0.9†	4.0	2.3	5.2	1.2	0.7	17.7
Revised	4.6	1.2	1.1	0.9	0.5	0.9	3.9	2.3	5.6	1.3	0.7	18.4
1953												
Old	4.4	1.2	1.1	0.7	0.4	0.9	3.9	2.3	5.1	1.2	0.7	17.5
Revised	4.8	1.2	1.2	0.9	0.5	0.9	3.7	2.3	5.5	1.3	0.7	18.3
1954												
Old	4.5	1.2	1.2	0.7	0.4	0.9	3.7	2.2	5.2	1.2	0.7	17.5
Revised	5.0	1.3	1.2	0.9	0.6	1.0	3.6	2.2	5.6	1.3	0.7	18.4
1955												
Old	4.4	1.2	1.2	0.7	0.4	0.9	3.6	2.1	5.1	1.3	0.7	17.2
Revised	5.0	1.2	1.3	1.0	0.6	0.9	3.4	2.1	5.5	1.3	0.7	18.0
1956												
Old	4.5	1.2	1.3	0.7	0.4	0.9	3.5	2.1	5.2	1.3	0.6	17.3
Revised	5.2	1.3	1.3	1.1	0.6	0.9†	3.3	2.1	5.6	1.4	0.7	18.4
1957												
Old						Discontinued						
Revised	5.3	1.3	1.4	1.1	0.6	0.9	3.2	2.1	5.6	1.4	0.7	18.3

* See footnote, table 1.

† Since percentages for the selected expenditures were not forced, rounding differences may exist between them (columns 2 and 8 through 12) and their totals (column 13). Total personal consumption expenditures are 100% in all instances.

‡ Forced so that sum of components equals percentage for all medical care.

tures, the hospital component accounted for half the 1.2 percentage point rise, from 4.1% to 5.3%, in medical care expenditures over these eleven years.

Drugs.—Continuing to measure components of medical care as a percentage of all personal consumption expenditures, we find the percentage the same for drugs in both series in 1947 and 1948. But from there on the resemblance between the old series and the new series ends. The old series indicates that from 1948 to 1956 (or 1947 to 1956) expenditures on drugs declined from 0.8 to 0.7% of all personal consumption expenditures. In sharp contrast the new series presents this component as

in 1957 provided one-fourth of the 1.2 percentage point rise in medical care as a percentage of all personal consumption expenditures between 1947 and 1957.

Dentists' Services.—Expenditures on dentists' services were much like those for drugs. They were the same (0.5%) for both series in 1947 and 1948. They also declined according to the old series and rose according to the new. The magnitudes, however, were not quite as great. But again the change in direction indicated by the data is serious. Between 1948 and 1956 these expenditures fell from 0.5% to 0.4% of all personal consumption expendi-

tures according to the old series, but rose from 0.5% to 0.6% according to the new. Consequently they accounted for two-sevenths of the difference between the old and the new series for 1956—4.5% and 5.2%—and for one-twelfth of the rise of 1.2 percentage point from 4.1% to 5.3% between 1947 and 1957.

"All Other."—There was no difference for "all other" medical care expenditures between the old and the new series; but this component experienced a 0.1 percentage point rise from 0.8 to 0.9% between 1948 and 1952. Hence it contributed nothing (like hospital expenditures) to the difference between the old and the new series in 1956, but contributed one-twelfth of the rise in medical care as a percentage of all personal consumption expenditures between 1947 and 1957.

Stable Demand for Physicians' Services

The chief change in estimated expenditures on physicians' services between the old and the new series and over 11 years occurred between the two estimates for 1948. The new series estimated that physicians' services received 1.3% of all personal consumption expenditures, whereas the old had estimated 1.2%. The same relationship between the old and the new series existed in 1956 as in 1948. Hence the physician component contributed one-seventh of the difference between the old and the new series in 1956. By reason of this change and for this reason only the physician component likewise contributed 0.1 percentage point or one-twelfth of the rise that occurred between 1947 and 1957 in medical care as a percentage of all personal consumption expenditures. The impressive feature of the physician component is that unlike every other it has within both series of estimates not risen since 1948. According to the old series it remained 1.2% of all personal consumption expenditures from 1948 through 1956 and according to the revised series it was 1.3% of all personal consumption expenditures in 1948 and in 1957 and in almost all intervening years. The constancy of this component in the face of rises elsewhere, according to the latest estimates, is quite impressive.

We have pointed not only to the constancy of expenditures on physicians' services as a percentage of all personal consumption expenditures (1947-1956, old series, and 1948-1957, new series) but additionally to the rise of 0.1 percentage point between the old and the new series. On this latter basis it might be argued that a very slight increase in demand for physicians' services has occurred. In reviewing this component back to 1929, however, it should be observed that for 29 years the percentage of all personal consumption expenditures allocated to physicians' services (private but not governmental demand) has experienced irregular oscillations between 1.2 and 1.3%, as in 1948-1952 and 1952-1957 in the new series. Thus it must be

concluded that the increase in demand for physicians' services, in the sense of a shift toward them and away from other forms of want-satisfaction, must be meager indeed. In brief, this empirical evidence lends little support to the contention, oft repeated, that an increasing population and rising incomes necessarily result in increased demands for physicians' services. The slight increase in quantity of services (as distinguished from value of services) that would result from the lesser rise in physicians' fees than in other prices since 1935-1939 (and presumably since 1929) would surely be more than offset by the increase in physician productivity since then.

Measured in terms of the percentage of personal consumption expenditures, the revised series raised the estimates for drugs substantially, dentists' services somewhat, and physicians' services slightly. Over the past 11 years the medical care component has risen as a portion of all personal consumption expenditures with hospitals' expenditures accounting for half the rise, drugs some of it, and dentists' services, physicians' services, and "all other" slightly and equally. Thus all components have participated in the rise. The physician sector, however, has been especially stable despite the baby boom, rising incomes, the rising proportion of older persons, and the expectation among many that these phenomena inevitably result in a shift to greater consumption of physicians' services.

Physicians Less, Hospitals More of Medical Dollar

The combination of forces reflected in the preceding measures—dollars and percentage of all personal consumption expenditures—takes on new light when the third measure, the medical care dollar, is employed. Inflation, increased allocation of consumption to medical care by revisions of the data, and the long term trends acquire additional light when this third measure is employed. It was mentioned earlier that a measure such as this is incapable of expansion—the parts, the components of medical care, have to be distributed over 100 cents.

The stable position which physicians' services has retained among all personal consumption is reflected by a declining share of the medical care dollar. As shown in figure 3, the physicians had 30 cents of the medical care dollar in 1947-1949; they had only 24 cents in 1957. The physicians' declining portion of the medical care dollar represents a continuation if not an acceleration of a trend which has been apparent since 1929. Then their share was 33 cents; in 1935-1939 it was 32 cents; in 1957, as already mentioned, it was 24 cents. The revised data—the percentages on the right side of figure 1 are also cents in the medical care dollar for 1956—also accentuated this trend, for the physician share of the medical care dollar, as shown in figure 1, fell through the revision from 27.0 to 24.7% (or from 27.0 to 24.7 cents) in 1956.

As the physician share of the medical care dollar has declined, the hospital share has risen. The latter's share (fig. 3) rose from 21 cents in 1947-1949 to 26 cents in 1957. It was only 14 cents in 1929 and 17 cents in 1935-1939. Again the trend has been

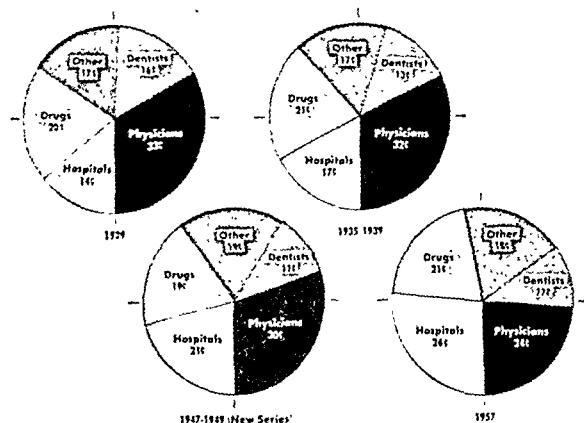


Fig. 3.—Division of medical care dollar (data from Office of Business Economics, U. S. Department of Commerce).

continuous, and this time upward, since 1929. The revised data in this case did not accentuate the trend; neither did they change it. As shown in figure 1, the hospital share in 1956 was 28.5% according to the old series but only 25.0% according to the new. Nevertheless, even with the revision, hospitals now receive the largest portion of the medical care dollar.

Other Shares Stable

Dentists' services over the last decade have held a stable portion of the medical care dollar. Their share (fig. 3) in 1947-1949 was 11 cents; it was the same in 1957. The revision of the data tended to maintain (or restore) this stable position. In 1956, as shown in figure 1, the dentists' share was only 8.8% according to the old series but 11.6% under the new. Even with this revision to maintain the trend since 1947-1949, the longer term trend for the dentists' share is downward. In 1929, as shown in figure 3, they had 16 cents and in 1935-1939 13 cents of the medical care dollar.

The drug share has also displayed substantial stability, this time over the longer period, fluctuating only between 19 and 21 cents over the 29-year period, 1929 to 1957 (fig. 3). Again the stability was bolstered by the revised data, since the old data (table 3) showed a decline between 1947-1949 and 1956, while the new data showed a slight rise. In 1956 (fig. 1) the old data indicated that the drug share was 15.6%, while the new showed that it was 20.4% of the medical care dollar; in 1947-1949 it was 19 cents. It had been 20 cents in 1929 and 21 cents in 1935-1939. The slight rise between 1929 and 1935-1939 in one instance and again a rise between 1947-1949 and 1957 in another instance might suggest that drugs are less sensitive to minor fluctu-

ations in business than are dentists' and physicians' services, if in fact such short-run forces are reflected at all in these long-run comparisons.

Since the "all other" component includes insurance overhead plus profits and there has been substantial expansion of medical, health, and accident insurance, one might have expected the share of this component to grow. Although the insurance overhead has increased from 108 million dollars in 1929 to 1,064 million dollars in 1957, the growth in dollar expenditures on all of the "all other" components has been only as rapid as that for all medical care expenditures. Consequently the "all other" share of the medical care dollar in 1957, 18 cents, was barely higher than it was in 1929 (17 cents) and slightly lower than it was in 1947-1949 (19 cents). The old series showed a slight rise, according to this third measure, between 1947-1949 and 1956 (table 3), but the revision reversed this, leaving the "all other" component in 1957 slightly lower than it was in 1947-1949. Among the three areas of accident and health insurance in 1957 the overhead portion was greatest for income-loss, 37.2%; next highest for hospital services, 35.3%; and lowest for

TABLE 3.—Percentage Distribution of Personal Consumption Expenditures for Medical Care: Old and Revised Series, 1947-1957*

Yr., Series	Physicians' Services	Hospitals	Drugs and Sundries	Dentists' Services	All Other Medical Care
1947					
Old	29.6	20.5	19.3	11.5	19.1
Revised	29.6	20.5	19.3	11.5	19.1
1948					
Old	29.8	21.5	18.4	11.3	19.0
Revised	30.1†	20.9	18.9	11.6	18.5
1949					
Old	30.0	22.5	17.5	11.1	18.9
Revised	29.1†	22.0	19.3	11.4	18.2
1950					
Old	29.4	23.0	17.0	10.5	19.2
Revised	27.7†	23.3	19.7	11.0	18.3
1951					
Old	28.8	24.7	17.3	10.1	19.1†
Revised	26.7	23.8	21.0	10.5†	18.0
1952					
Old	28.5	25.5	16.7	9.6	19.7
Revised	26.1	24.5†	20.2	10.8	18.4
1953					
Old	27.8†	26.1	16.0	9.3	20.8
Revised	25.7†	24.6	19.3	11.1†	19.3
1954					
Old	27.5	26.0	15.4	9.2	21.0
Revised	26.1	24.8	18.1	11.8	19.2
1955					
Old	27.2	27.6	15.5	9.0	20.5
Revised	24.9	25.2	19.3	11.7†	18.9
1956					
Old	27.0	28.5	15.6	8.8	20.1
Revised	24.7	25.0	20.4	11.6	18.3
1957					
Old			Discontinued		
Revised	24.5	25.8	20.6	11.3	17.8

* See footnote, table 1.

† Forced so that total medical care equals 100%. Total medical care equals 100% in all series.

physicians' services, 27.5%. Even so the last seems relatively high and may be subject to revision in the future. The latter two items might be considered as additions to personal consumption expenditures for hospital and physicians' services but we have made no attempt to make them additions.

Summary

Review of the latest series of personal consumption expenditures—purchases by private individuals rather than by government—reveals a substantial change in the data for 1956 and a considerable rise in the consumption of medical care in the last decade. The rise has not been uniform, however, among all components of medical care. It was greatest for hospitals and drugs. For the other three chief components, as the critical measure—percentage of all consumption expenditures—shows, it was slight. Indeed the demand for physicians' services

relative to the demands for all want-satisfying goods and services has been quite stable for all of the almost 30 years for which data are available. These increases in personal consumption expenditures on, but not costs of, medical care, however uneven, are of interest and concern to all students of medical economics.

References

1. Dickinson, F. G., and Raymond, J.: Economic Position of Medical Care, 1929-1953, Bulletin 99, American Medical Association, Bureau of Medical Economic Research, Chicago, 1955.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

SUPPLEMENTARY LIST—CORRECTIONS

In the annual Internship and Residency Number of THE JOURNAL, Oct. 4, 1958, incomplete or inaccurate data were presented. The correct entries are as follows:

Approved Residencies and Fellowships

Name of Hospital and Location	Control	Total Beds	INTERNSHIPS					Beginning Stipend (Month)	Number and Type of Internships	Code Number
			Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service			
St. Francis Hospital *1-3-4..... 114 Woodland St., Hartford 5, Conn.	Church	578	20,265	Req	49	12	No	150-225PM	13 Rotating General	08511
Kings County Hospital *1-3-4-X59.... 451 Clarkson Ave., Brooklyn 3, N. Y.	City	3,167	57,842	Req	33	12	No	71PM	114 Rotating General 22 Straight Medicine 10 Straight Surgery 3 Straight Pediatrics 1 Straight Pathology	42611 42632 42633 42634 42636

ANESTHESIOLOGY

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First Year Residents Offered *	Total Residents Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Veterans Admin. Hospital 1-3.....	Boston (Jamaica Plain)	D. L. Muhler.....	4,760	1,514	1	12	12	...
Cambridge City Hospital 1-3.....	Cambridge, Mass.	F. C. Callahan.....	3,849	2,575	2	12	12	160
St. Elizabeth Hospital 1-3.....	Youngstown, Ohio	A. J. Bayuk.....	11,040	9,459	1	12	12	300
University of Utah College of Medicine Affiliated Hospitals*	Salt Lake City	C. M. Bullinger.....	20,867	16,427	6	13	2	275

* Thos. D. Dee Memorial Hospital, Ogden, Utah; Holy Cross Hospital, St. Mark's Hospital, Salt Lake County General Hospital, Shriners Hospital for Crippled Children, and Veterans Admin. Hospital, Salt Lake City.

DERMATOLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residents Offered *	Total Residents Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Temple University Medical Center Skin and Cancer Hospital Unit.....	Philadelphia	C. S. Wright.....	641	26,144	4	12	1	100

NEUROLOGY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residents Offered *	Total Residents Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Los Angeles County Hospital 1.....	Los Angeles	E. R. Ives.....	3,460	282	1	2	1	246

OBSTETRICS-GYNECOLOGY

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Ap- proved Pro- gram (Years)	Beginning Stipend (Month)
Mayo Foundation.....	Rochester, Minn.	A. B. Hunt.....	OBG	4,089	3	4	12	3	175
Ancker Hospital ¹⁻³⁻²⁴	St. Paul	E. Kasper.....	OBG	1,068	1	1	1	1	220
Aultman Hospital ¹⁻³	Canton, Ohio	H. I. Keck.....	OBG	5,758	4	3	5	3	275

ORTHOPEDIC SURGERY

Type of training acceptable to Board: A—Adult Orthopedics; C—Children's Orthopedics; F—Fractures. Residency programs in the following hospitals have been approved by the Council and the American Board of Orthopedic Surgery, through the Residency Review Committee for Orthopedic Surgery, as offering acceptable training in adult orthopedics, children's orthopedics, and fractures. Training in the basic sciences is given either as an integral part of these services or as a separate course. Services collaborating in an integral plan of training are designated by a program number.

Residents completing their training in these hospitals are eligible for full certification by the American Board of Orthopedic Surgery, including children's orthopedic surgery.

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Ap- proved Pro- gram (Years)	Beginning Stipend (Month)
University of Missouri Medical Center ¹⁻³	Columbia, Mo.	W. J. Stewart.....	ACF	61	...	...	...	1	...	...
Veterans Admin. Hospital ¹⁻³	St. Louis	O. P. Hampton, Jr.	AF	61	419	3	1	3	...	...

PEDIATRICS

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Ap- proved Pro- gram (Years)	Beginning Stipend (Month)
Children's Hospital ¹⁻³	San Francisco	H. E. Thelander- E. B. Shaw.....	904	15	2	4	2	175

RADIOLOGY

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Resi- dencies Offered *	Total Resi- dencies Offered *	Beginning Stipend (Month)
San Francisco Hospital.....	San Francisco	L. H. Garland- A. J. Williams.....	45,348	30	2,215	105	..	6	260

SURGERY

The residency program in the following hospital has been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for THREE years of training, designed to qualify the trainee for examination by the American Board of Surgery as a Group II candidate.

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Aultman Hospital ¹⁻³	Canton, Ohio	W. M. Dowlin.....	6,399	50	6	12	275

The residency program in the following hospital has been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for additional training following the completion of an approved residency. The American Board of Surgery will give credit for time spent in this service toward fulfillment of the practice requirements for Group II candidates.

Babies' Hospital ¹⁻³	New York City	T. V. Santulli.....	924	21	..	1	333
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THORACIC SURGERY

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Ap- proved Pro- gram (Years)	Beginning Stipend (Month)
Medical College of Georgia Hospitals		R. G. Ellison.....	1220	19	..	2	...	...
Eugene Talmadge Memorial Hospital.....	Atlanta, Ga.		...	..	..	..	..	...
Battery State Hospital.....	Rome, Ga.		...	..	..	..	..	...

MEDICAL NEWS

CALIFORNIA

Dr. Rothman Honored by French Society.—Dr. Theodore Rothman, a psychiatrist on the faculty of the University of Southern California School of Medicine, Los Angeles, has been named an honorary member of the French Society of the History of Medicine. Dr. Rothman has made a study of Montaigne and read a paper on the 16th century essayist at Montpellier, France, in September.

Personal.—Dr. Henry B. Bruyn has been appointed director of student health services at the University of California, Berkeley, effective July 1. Dr. Bruyn is associate professor of pediatrics and medicine, University of California Medical School, an appointment which he will continue on a part-time basis.

—Dr. Harry A. White, Los Angeles general practitioner, was installed as president of the Queen of Angels medical staff Dec. 16, succeeding Dr. James N. O'Neill. Installed with Dr. White were physicians Roscoe B. Bigler, vice-president, and Leonard G. Powsner, secretary and treasurer. —Dr. John W. Bisenius, of Los Angeles, has been named to the newly-created post of director of medical education at Queen of Angels Hospital.

COLORADO

Dr. Crowle Wins Award.—Alfred J. Crowle, Ph.D., research microbiologist, Colorado Foundation for Research in Tuberculosis, Denver, has been awarded the annual James Alexander Miller fellowship by the New York Tuberculosis and Health Association of New York City. The fellowship is for the 1959-1960 year in the amount of \$7,000 and will support Dr. Crowle's studies in immunology and tuberculosis. Dr. Roger S. Mitchell, director of the Colorado Foundation, said that Dr. Crowle was selected for the honor in nation-wide competition with many researchers in tuberculosis and other chest disorders. The fellowship was created by friends and former patients of the late Dr. Miller, an authority on chest diseases in the New York area prior to his death in 1949. Dr. Crowle is also an instructor in the department of microbiology of the University of Colorado School of Medicine.

DISTRICT OF COLUMBIA

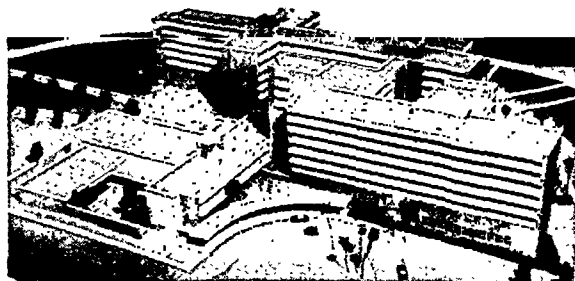
Dedicate Research Center.—The Medical Research Center at Brookhaven National Laboratory was dedicated on Dec. 16, following a two-day conclave

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

of deans of medical colleges. The dedicatory address was delivered by Dr. Shields Warren, pathologist at New England Deaconess Hospital and professor of pathology, Harvard Medical School, Boston. John A. McCone, chairman of the Atomic Energy Commission, also spoke at the ceremonies. The \$6,500,000 center includes a tank-type reactor, a 48-bed hospital for research patients, and laboratories for studies in biochemistry, medical physics, microbiology, pathology, and physiology. The reactor is the first in this country to be designed specifically for medical research purposes.

FLORIDA

Open New Teaching Hospital and Clinics.—The University of Florida's new 10-million-dollar Teaching Hospital and Clinics were opened for the admission of patients Oct. 20 in Gainesville, Dr. Rus-



The J. Hillis Miller Health Center, University of Florida College of Medicine and Teaching Hospital, Gainesville.

sell S. Poor, provost of the J. Hillis Miller Health Center, which includes the Teaching Hospital and Clinics, the colleges of medicine, nursing, health related services, and pharmacy, and the Cancer Research Laboratory, has announced. The eight-story building was opened for tours by the public and alumni Oct. 18-19. Initially only about 100 beds have been opened. Dr. George T. Harrell, dean of the College of Medicine, explained it is planned that an additional 50 beds will be opened every three months until all 400 beds are available for use, with further expansion geared to the selection of staff. It was necessary that the hospital and clinics open this fall to accommodate the first class of students of medicine and nursing, now beginning their third year of studies. Patients will be admitted only on referral by the family physician, but patients under the care of public health departments may be referred by the medical officer in charge. All referrals will be made to the chief of staff or the

chief of a special service. The new structure contains more than 400 acute and ambulant beds, 28 operating rooms, and 22 outpatient clinics in various medical services and specialties. Rehabilitation facilities are reportedly the most extensive available in the South. The ambulant wing, featuring 26 special rooms for patients who do not require constant nursing and medical care, has day beds instead of the traditional hospital bed. These rooms feature television, dial phones, and are otherwise furnished and decorated as a modern Florida motel room. The Teaching Hospital and Clinics will become the permanent home of the College of Nursing, which heretofore has had its headquarters in the Medical Sciences Building. About 25% of the floor space in the hospital and clinics is devoted to teaching functions.

GEORGIA

Medical Assembly in Atlanta.—The 1959 Atlanta Graduate Medical Assembly will be held Feb. 16-18 at the Convention Hall, Atlanta Biltmore Hotel. The 14 speakers (and their specialists), who will present topics ranging from allergy to nuclear medicine, are:

Dr. Stewart Wolf, Oklahoma City (internal medicine); Dr. Ethan Allan Brown, Boston (allergy); Dr. Edward H. Ryneason, Rochester, Minn. (endocrinology); Dr. William G. Sauer, Rochester, Minn. (gastroenterology); Dr. William Dameshek, Boston (hematology); Dr. B. Marden Black, Rochester, Minn. (surgery); Dr. Warren H. Cole, Chicago (surgery); Dr. Denton A. Cooley, Houston, Texas (cardiovascular surgery); Dr. Averill A. Liebow, New Haven, Conn. (pathology); Dr. Charles M. Nice, Jr., New Orleans (radiology); Dr. Vincent J. Collins, New York City (anesthesiology); Dr. Curtis J. Lund, Rochester, N. Y. (obstetrics and gynecology); Dr. A. Ashley Weech, Cincinnati (pediatrics); and Dr. Lee E. Farr, Upton, Long Island (nuclear medicine).

Luncheon conferences and afternoon round-table discussions are planned. Dr. Nice will lecture on "Dixieland Jazz" at a luncheon conference Feb. 17. Advanced registration fee is \$15. For registration and information write the Atlanta Graduate Medical Assembly, 875 W. Peachtree St., N. E., Atlanta 9, Ga. The assembly, in cooperation with the Georgia Academy of General Practice, is acceptable for 15 hours in category I.

ILLINOIS

Chicago

New Medicohistorical Society.—The University of Chicago History of Medicine Society has been founded for the purpose of promoting interest in the history of medicine, membership being open to all interested persons in the university community. A series of lectures will be presented by faculty members and guests, and regularly scheduled seminars on topics in the history of medicine will be conducted each week by Ilza Veith, Ph.D.

Hospital News.—Michael Reese Hospital and Medical Center has announced the appointment of Dr. Maurice S. Goldstein to head the department of metabolism and endocrinology at the Medical Center's Research Institute, succeeding Dr. Rachmiel Levine, who resigned to devote additional time to two other positions at Michael Reese as director of medical education and chairman of the department of medicine.

KENTUCKY

Dr. Kornhauser Dies.—Sidney I. Kornhauser, Ph.D., professor and chairman of the department of anatomy, University of Louisville School of Medicine from 1922 to 1958, died in his sleep Jan. 1, aged 71. Born in Cleveland, he received his A.B., University of Pittsburgh in 1908, his M.A. from Harvard University, Boston, in 1910, and a Ph.D., there in 1912. Executive Secretary of Faculty, 1939-1948, he served as chairman of the Commission on Biological Stains. Dr. Kornhauser was the author of numerous articles on microscopic anatomy.

MASSACHUSETTS

Tufts Medical Alumni Lecture.—The annual Tufts Medical Alumni Lecture will be given Feb. 18, 7:30 p. m., at Tufts Medical School in Posner Hall, 200 Harrison Ave., Boston, by Dr. Edward H. Dennen, professor of clinical obstetrics and gynecology, Cornell Medical School and director of the department of obstetrics at the New York Polyclinic Hospital. Dr. Dennen will speak on "Prerequisites for Instrumental Delivery." Medical students and physicians are invited.

Personal.—At the meeting of the Board of Registration in Medicine, Department of Civil Service and Registration, Commonwealth of Massachusetts, held Oct. 30, the following officers were elected as of Nov. 1: Dr. David W. Wallwork, North Andover, secretary; and Dr. Roger T. Doyle, Boston, chairman. Dr. Robert C. Cochrane, Boston, the former secretary, resigned as of Oct. 31.—Dr. Jack Richard Ewalt, Commissioner of Mental Health in Massachusetts and clinical professor of psychiatry at Harvard Medical School, has been named professor of psychiatry to serve simultaneously the Massachusetts Mental Health Center as director and the Harvard Medical School as professor, effective Dec. 1. In his post at the Harvard Medical School and at the Massachusetts Mental Health Center (formerly the Boston Psychopathic Hospital) Dr. Ewalt succeeds Dr. Harry C. Solomon, professor of psychiatry, emeritus. Dr. Solomon, in turn, has been appointed to Dr. Ewalt's post as Commissioner of Mental Hygiene.—Dr. Howard M. Payne, formerly professor of medicine, Howard University, Washington,

D. C., and a member of the board of directors of the National Tuberculosis Association, has been appointed superintendent, Middlesex County Sanatorium, Waltham, Mass.

MICHIGAN

Establish Professorship in Medicine.—Wayne State University College of Medicine, Detroit, has received a \$30,000 gift from the National Foundation of Rochester (Mich.) to establish the William H. McGregor professorship in medicine. William H. McGregor founded the National Twist Drill and Tool Co., now in Rochester, in 1903. He served several terms as Wayne County Clerk and was president of the Detroit Board of Education in 1898. The National Foundation of Rochester was formed by a nephew, Howard McGregor Sr., former president of National Twist Drill and Tool Co., and a grand-nephew, Howard McGregor Jr., now president of the company.

MISSOURI

Grant for Mental Retardation Program.—The Saint Louis University School of Medicine has been awarded a grant of \$250,000 by the Children's Bureau of the Department of Health, Education and Welfare, United States Public Health Service, for the establishment of a mental retardation program at Cardinal Glennon Memorial Hospital for Children. The grant award is for a five-year period with allotments of \$50,000 annually. The program will be under the direction of Dr. James P. King, director of the department of pediatrics and chief-of-staff, Cardinal Glennon Memorial Hospital, and will be correlated with the Bureau of Maternal and Child Health of the Missouri Division of Health. The award money will be used to establish salaries, equipment and travel expenses for personnel for the diagnosis, program planning, and treatment of mentally retarded children. Personnel will include the appointment of a full-time pediatrician who will serve as director, an assistant pediatrician, a psychologist, social worker, and public health nurse. The major part of the programs will be an out-patient facility, and will be coordinated with the pediatric medical clinic and the rehabilitation clinics of the out-patient department at the hospital. The function of the new program will be state-wide. The personnel of the program will develop institutes, workshops, and other educational programs throughout the state in conjunction with the Missouri Division of Health.

MONTANA

Dr. Harris Named Secretary-Treasurer.—Because of the sudden death of Dr. T. R. Vye, secretary-treasurer of the Montana Medical Association, Dr. William E. S. Harris, Livingston, who was elected to the office of assistant secretary-treasurer at the

last meeting of the House of Delegates, will serve as acting secretary-treasurer until the next meeting of the House of Delegates at the Interim Session of the association which will be held in Helena, April 3-4. At that meeting the nominating committee will submit its nominations for the office of secretary-treasurer and assistant secretary-treasurer for the remainder of the current administrative year.

NEBRASKA

New Unit for University Hospital.—Ground-breaking ceremonies for Unit III of University Hospital and the University of Nebraska College of Medicine, Omaha, were held Dec. 27, and work on the unit was started immediately. Dean James P. Tollman, who was master of ceremonies, introduced Chancellor Clifford Hardin and Governor-Elect Ralph Brooks, who addressed the audience. The new unit is planned for use as expanded outpatient clinics and supportive activities, along with modern radiology and pathology departments and classroom areas. Omahans attending the ceremonies included Mayor John Rosenblatt; Philip Milo Bail, Ph.D., president of Omaha University; Dr. Stanley N. Truhlsen, president of the University of Nebraska College of Medicine Alumni Association; and Dr. Frederick G. Gillick, dean of the Creighton University College of Medicine.

NEW YORK

Radiological Meeting in Nassau.—The Radiological Society of the State of New York will hold a Bahamas Spring Conference March 6-13, aboard the S. S. Nassau and at the Fort Montagu Beach Hotel, Nassau. Each of the following speakers will present three lectures in his designated field:

Pediatric radiology, Dr. John Caffey, New York City.
General radiology, Dr. Barton R. Young, Philadelphia.
Radiation therapy, Dr. Maurice Lenz, New York City.
Radioactive Isotopes and protection in radiology, Dr. Richard H. Chamberlain, Philadelphia.

Dr. John F. Roach, president of the society, will open the conference in Nassau, March 10. The advanced registration for this meeting closes Feb. 15. For information write Dr. Mario C. Gian, 610 Niagara St., Buffalo 1, N. Y., Secretary-Treasurer.

Lectures for Laity in Syracuse.—A series of public lectures on the medical sciences will be held at the State University Upstate Medical Center, Syracuse, starting Feb. 8. The seven lectures, designed for the layman, will be held each Sunday afternoon at 3 p. m. in the auditorium of the Medical College, 766 Irving Ave. Dr. Carlyle Jacobsen, president of the Upstate Medical Center, said they were being staged as part of the center's observance of its Dedication Year which marks completion and dedication of the large new Basic Sciences Building.

Admission is free and all lectures will be followed by a general question-and-answer period. The schedule is as follows:

- Feb. 8—"Cancer," by Wilfred W. Westerfeld, Ph.D., professor of biochemistry.
- Feb. 15—"Obesity," by Dr. S. Jay Tepperman, professor of experimental medicine.
- Feb. 22—"High Blood Pressure," by Dr. Gordon K. Moe, professor of physiology.
- March 1—"Food and Health," by John M. McKibbin, Ph.D., professor of biochemistry.
- March 8—"The Aging Process," by Dr. Richard H. Lyons, professor of medicine.
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Admission is free and all lectures will be followed by a general question-and-answer period. The schedule is as follows:

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Symposium on Study of Venereal Diseases.—The 10th annual Symposium on Recent Advances in the Study of Venereal Diseases will be held April 27-28 at Johns Hopkins University, Baltimore. The sessions are open to all physicians and workers in allied fields interested in the venereal diseases. This symposium, sponsored jointly by the American Venereal Disease Association and the U. S. Public Health Service, will precede a Venereal Disease Seminar for public health personnel of 14 eastern states, beginning April 29. Anyone wishing to present a scientific paper on a subject related to venereal disease should mail preliminary abstracts to Dr. William J. Brown, chairman of the program committee, by Feb. 15. His address is Communicable Disease Center, Public Health Service, 50 Seventh St., N. E., Atlanta 23, Ga. The committee will meet in mid-February to select papers to be presented. Authors of accepted papers will be notified before March 15.

Essay Contest for Physician-Writers.—The 1959 competition in the Mississippi Valley Medical Society Annual Essay Contest has been announced. Any subject of general medical or surgical interest including medical economics and education may be submitted, providing the paper is unpublished and is of interest and applicable value to general practitioners of medicine. Contributions are accepted only from physicians who are members of the A. M. A. and who are residents and citizens of the United States. Manuscripts, not to exceed 5,000 words, must be submitted in five complete copies, in manuscript style. The winning essay receives a cash prize of \$100, a gold medal, and a certificate, also an invitation to address the annual meeting of the Mississippi Valley Medical Society, Sept. 30-Oct. 2. The society may also award certificates of merit to physicians whose essays rate second and third best. Essays must be in the office of the society secretary not later than May 1. Winning essays are published each year in the January *Mississippi Valley Medical Journal* (Quincy, Ill.). For information write Dr. Harold Swanberg, Secretary, Mississippi Valley Medical Society, 209-224 W.C.U. Building, Quincy, Illinois.

Homicide Rate Decreases.—In contrast to the marked increase in major crimes, the incidence of homicide in the United States has decreased in the period since World War II, according to statisticians of the Metropolitan Life Insurance Company. The age-adjusted homicide rate fell about 20% between 1946-47 and 1955-56, from 6.1 to 4.8 per 100,000 of population. The relative decline was greater for white than for nonwhite persons, and for each race was much greater for males than for females. Among white males, the decrease amounted to 25%; among nonwhite males it was 20%. Among white persons the homicide rates vary but little in the

range of ages from early adult life through middle age, and decrease only moderately at the older ages. Among nonwhites, and particularly for males, the toll from homicide rises to a definite peak in the late 20's and early 30's, and then falls rapidly with advance in age. Despite the increase in juvenile delinquency in recent years, the homicide rate at ages 15 to 19 decreased. Moreover, the rate at these ages is much lower than that for most adult age groups.

Meeting on Ski Injuries.—"Doctors and Skis" is the title of a meeting on skis and ski injuries to be held at the Wendell-Sherwood Hotel, Pittsfield, Mass., Feb. 19-20. Over 15 papers are scheduled for presentation. Dr. E. J. Coughlin Jr., Williamstown, Mass., chairman, Regional Committee on Trauma, American College of Surgeons, will open the meeting. Dr. Barbara Stimson, Poughkeepsie, N. Y., chairman of the Mid-Hudson Trauma Committee of the college, will present "Fractures of the Tibia." A symposium on "One of a Kind Injuries" is planned for the morning of Feb. 20, with a panel discussion on the prevention of Ski Injuries to be held that afternoon. The guest speaker at the banquet Feb. 19, 6:30 p. m., will be Dr. Hans Kraus, New York City, chairman, Medical Advisory Committee, Eastern Division, National Ski Patrol, who will speak on "Preconditioning and Rehabilitation of Ski Injuries." For information write Dr. Edward J. Coughlin Jr., c/o Berkshire Hills Conference, 50 South St., Pittsfield, Mass.

Northwest Physicians Meeting in Vancouver.—The Pacific Northwest Regional Meeting of the American College of Physicians for Oregon, Washington, and British Columbia will be held Feb. 14 at St. Paul's Hospital Auditorium, Vancouver, B. C. Papers which include invited authors are:

Respiratory Function: Clinical Aspects, Dr. Harold V. Rice, Vancouver, B. C.

Experience with Glipasol, a New Oral Hypoglycaemic Drug, Drs. T. W. Davis, R. B. Kerr, and A. Bogoch, Vancouver, B. C.

A Study in Calcium Infusion in Normal Subjects and in Patients with Paget's Disease, Drs. G. D. McPherson, D. H. Copp, H. W. McIntosh, and T. C. Johnson, Vancouver, B. C.

At the evening session the speakers will be Dr. Howard P. Lewis, president-elect of the college and Harry V. Warren, professor of mineralogy, department of geology and geography, University of British Columbia. Dr. Warren will speak on "Geology and Health." For information write Dr. George A. Davidson, 3195 Granville St., Vancouver 9, B. C., Canada.

Scholarships for Mexican Physicians.—The American Rhinologic Society has announced that it provided full scholarships to five Mexican physicians and half scholarships to six to enable them to attend a course

in reconstructive nasal surgery presented at the White Memorial Hospital, Los Angeles, Jan. 9-16. Sponsored jointly by the departments of otolaryngology of the College of Medical Evangelists and University of Southern California School of Medicine, Los Angeles, with the cooperation of the American Rhinologic Society, the course was on "Reconstructive Surgery of the External Nasal Pyramid and Nasal Septum," under the direction of Dr. Maurice H. Cottle, professor of otolaryngology, Chicago Medical School. Dr. Amos E. Friend, of Manchester, Conn., chairman of the society's Public Relations Committee, said the scholarships were designed to further cement international relations as well as to spread surgical knowledge. At the request of a group of Mexican otolaryngologists, the American Rhinologic Society sent two of its members, Drs. Robert M. Hansen, of Portland, Ore., and George H. Drumheller, of Everett, Wash., to present a five-day course at the University of Michoacan Medical School, Nov. 10-15, 1958.

Open Competition for Lipreading Scholarship.—Competition for the 1959 Kenfield Memorial Scholarship, awarded annually by the American Hearing Society to a prospective teacher of lipreading, will open Feb. 1. Application blanks, obtained by writing to Miss Ruth Bartlett, chairman of the society's teachers committee, 432 S. Curson Ave., E., Los Angeles 36, must reach Miss Bartlett by April 1. Winner of the scholarship will be entitled to take a course in "Methods and Practice in Teaching Lipreading" from any school or university in the U. S. offering a course acceptable to the committee. The scholarship must be used within one year. A satisfactory applicant shall be a "well-adjusted individual with a pleasing personality, legible lips, good speech and voice, and no unpleasant mannerisms." Graduation from college, with a major in education, psychology, and/or speech, is a requirement. If the applicant is hard of hearing, he must have had 30 clock hours of private instruction under an approved teacher of lipreading, or 60 clock hours of lessons in public school classes under a qualified lipreading teacher. Funds establishing the scholarship were subscribed in 1937 in memory of the late Miss Coralie N. Kenfield, San Francisco, known for her effective methods of teaching lipreading. In 1958 the Kenfield award was won by Mr. Stuart Edmonds, Midland, Mich.

Award for Contributions to Therapy.—Each year the American Therapeutic Society presents the Oscar B. Hunter Memorial award in honor of its late secretary, Dr. Oscar B. Hunter. The award is made in recognition of an outstanding contribution or series of contributions to therapy by an individual or team of workers. One object in making the award is to bring recognition to those who have not received distinguished awards for their

work. The term "therapy" is used to include the use of drugs, procedure, or device of benefit in the treatment of patients. The award consists of a bronze medal mounted on a plaque, struck in the likeness of Dr. Hunter and engraved with the name of the recipient. The winner will be expected to present a paper at the time of the presentation of the award, covering the work forming the basis of the award. Travel expenses to the meeting will be furnished. The deadline for receiving nominations for the 1959 award is March 1. Previous recipients are Dr. Jonas E. Salk (1955), Dr. Eugene M. K. Geiling (1956), Dr. Robert W. Wilkins (1957), and Dr. C. Walton Lillehei (1958). Nominations may be made by sending a letter, including reasons for the nomination, to Dr. Harry E. Ungerleider, 393 Seventh Ave., New York 1. The curriculum vitae of the candidate and a list of his publications should also be included.

New Journal of Neurology.—Academic Press Inc., publishers, have completed plans for a new journal, *Experimental Neurology*, for which William F. Windle, Ph.D., chief of the laboratory of neuroanatomical sciences, National Institutes of Health, Bethesda, Md., will be editor. He will be assisted by six associate editors, Drs. Sam L. Clark, Edward W. Dempsey, Ph.D., Louis B. Flexner, Seymour S. Kety, Horace W. Magoun, Ph. D., Roger J. Rossiter, and an international editorial board. The periodical will publish results of original research by experimental methods, and it will stress particularly the basic neurological sciences. Neurophysiology, pharmacology, chemistry, and experimental neuroanatomy, embryology, pathology are the disciplines to be considered. Physiological psychology and the clinical sciences will not be excluded, nor will a limit be placed on the range of species constituting subjects of experiments. The initial number of *Experimental Neurology* will be published early in 1959, and the remaining issues will appear at bi-monthly intervals. Manuscripts in the English language and editorial queries may be submitted to the Editorial Office, Room 3D-14, Building 10, Laboratory of Neuroanatomical Sciences, National Institutes of Health, Bethesda 14, Md. Subscription information is available from the Publishers, Academic Press Inc., 111 Fifth Ave., New York 3.

Society News.—Officers recently elected by the Central Society for Clinical Research are as follows: Dr. Edgar S. Gordon, Madison, Wis., president; Dr. John H. Dingle, Cleveland, vice-president; and Dr. Austin S. Weisberger, Cleveland, secretary-treasurer. The next annual meeting will be held Nov. 6-7, 1959, at the Drake Hotel, Chicago.—The Gerontological Society, Inc., has elected the following officers: president, Mr. Louis Kugel, Sacramento, Calif.; president-elect, Nathan H.

Shock, Ph.D., Baltimore; secretary, Robert W. Kleemeier, Ph.D., St. Louis; and treasurer, Dr. John E. Kirk, St. Louis. The next meeting will be held at the Statler Hotel, Detroit, Nov. 12-14, 1959.—The officers of the American Roentgen Ray Society for 1958-1959 are: president, Dr. Barton R. Young, Philadelphia; president-elect, Dr. Edward B. D. Neuhauser, Boston; first vice-president, Dr. Franklin B. Bogart, Chattanooga, Tenn.; second vice-president, Dr. Bradley A. Soule Jr., Burlington, Vt.; secretary, Dr. C. Allen Good, Rochester, Minn.; and treasurer, Dr. Robert K. Arbuckle, Oakland, Calif.—The Southern Medical Association has elected the following officers: Dr. Milford O. Rouse, Dallas, Texas, president; Dr. Edwin Hugh Lawson, New Orleans, president-elect; Dr. Tom D. Spies, Birmingham, Ala., first vice-president; and Dr. Edwin L. Zander, New Orleans, second vice-president.—The following are the officers of the American Academy of Dermatology and Syphilology for the year 1959: Drs. Anthony C. Cipollaro, president; Norman M. Wrong, vice-president; Robert R. Kierland, secretary-treasurer; Stanley E. Huff, assistant secretary-treasurer; and Samuel J. Zakon, historian.—National headquarters of the American Hearing Society were moved to 919 18th St., N. W., Washington 6, D. C., during the Christmas holidays. The agency occupies first floor space in an eight-story building which is being remodeled and converted from apartments to offices.

Symposium on Germfree Research.—A national symposium on the technology of germfree research will be held April 8-9 at Lobund Institute, University of Notre Dame, South Bend, Ind. Sponsoring institutions, in addition to Lobund Institute, are the Office of Naval Research, the Institute of Laboratory Animal Resources (National Academy of Sciences-National Research Council), and the Public Health Service's National Institutes of Health. The design, construction, and maintenance of germfree equipment as well as knowledge or workable techniques for rearing animals in a germfree environment are the aims of the forthcoming symposium, which also covers the broad field of gnotobiotics, a term used to describe the science of rearing laboratory animals whose flora and fauna are specifically known. The first symposium on gnotobiotics was held in 1939 at Lobund Institute, formerly known as the laboratory of bacteriology of the University of Notre Dame. Papers at the 1959 symposium will be presented on microbiological control procedures, methods of diet sterilization, and techniques for rearing animals in a germfree environment. Time will be allowed for round-table discussion. Registration begins at 8:00 a. m., April 8, and the first session is at 10:00 a. m. Information is available from the chairman of the symposium, Prof. Philip C. Trezler, Lobund Institute, University of

Notre Dame, South Bend, Ind., and Donald L. Snow, Chief, Sanitary Engineering Branch, Division of Research Services, National Institutes of Health, Bethesda, Md.

Symposium on Instrumental Analysis.—The Instrument Society of America has announced its 18th annual Symposium on Instrumental Methods of Analysis, programed by the Analysis Instrumentation Division, will be held at the Shamrock-Hilton Hotel, Houston, Texas, May 18-20, 1959. Dr. J. D. Lindsay, head of Texas A&M's chemical engineering department, will keynote the symposium theme, "New Techniques in Analytical Instrumentation for Laboratories and for Processing Plants." Program topics include:

- May 18—Economics of Instrumental Analysis; Electrochemical Methods of Analysis; New Approaches to Instrumental Analysis; Advances in Chromatography Theory.
- May 19—Instrumentation for Chemical Methods of Analysis; Instrumentation for Optical Methods of Analysis; Instrumentation for Physical Methods of Analysis; New Design Techniques in Process Analysis Instrumentation; Unique Laboratory Instruments for Analysis Instrumentation.
- May 20—Process Chromatography; Radiation in Analysis Instrumentation; X-Ray and Microwave Spectroscopy.

All contributors desiring to present papers at this meeting should send title; authors, and three copies of a 100-word abstract to M. D. Weiss, Program Chairman, Special Instrumentation Division, Union Carbide Olefins Company, South Charleston, W. Va. Final deadline for submission of "Intent to Present a Paper" is Feb. 15, 1959. However, the program will be closed as soon as enough papers are received to complete each session.

Grants for Nutrition Research.—The Nutrition Foundation recently assigned \$128,000 for grants-in-aid and educational projects to 12 universities and medical schools in the United States, Canada, and Central America, it was announced by Charles G. King, Sc.D., executive director of the foundation. Since its founding 17 years ago, the foundation has allocated 302 grants-in-aid totaling over \$5,200,000 to support research by medical and nutritional scientists. The new grants will permit these noted research scientists to extend present investigations or launch new studies in the area of nutritional science. In addition, Dr. King reported that almost one million dollars in supplementary funds have been donated by member and nonmember companies to support the foundation's intensified program to determine the relationship of edible oils and fats to overweight and to possible changes in blood cholesterol. One grant was made to Dr. Nevin S. Scrimshaw, of the Institute of Nutrition of Central America and Panama, for intensive research into the significance of diets low in animal protein, fats and other nutrients. The largest grant (\$23,000 over a two-year period) was assigned to the University

of Notre Dame, where Dr. Bernard S. Wostmann will be able to continue his pioneering work in determining the nutrient requirements of germ-free animals. The Nutrition Foundation is a nonprofit research organization, industry-financed, and operated in the public interest. Supporting basic research and education in the science of nutrition, the foundation during the past year has distributed more than a million dollars in grants to medical and graduate schools in the United States, Canada, and Central America.

FOREIGN

Congress of Allergy in London.—The Fourth European Congress of Allergy will be held in London Sept. 2-4 under the presidency of Prof. R. J. S. McDowall. Honorary president of the congress is Sir Henry Dale. The main subjects will be as follows:

Nature and chemistry of allergens and their antibodies.

The mechanism of allergic reactions.

Aerobiology in relation to allergy in Europe (with special reference to mould spores).

Allergic reactions to drugs administered systemically or topically.

The long-term therapy of asthma with hormones.

Significance of psychological factors in asthma.

The official languages will be French, German, and English, and a translation service will be organized. A second theatre will be available for free subjects. Demonstrations and a program of entertainments will be organized. For information write the General Secretary, Dr. A. W. Frankland, St. Mary's Hospital, London, England.

EXAMINATIONS AND LICENSURE



NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications was Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Written.* Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

ALASKA: * On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

ARKANSAS: * *Examination and Reciprocity.* Little Rock, June 11-12. Sec., Dr. Joe Verser, Harrisburg.

CONNECTICUT: * *Regular. Examination.* Hartford, March 10-12. Acting Sec., Dr. Louis P. Hastings, 160 St. Ronan St., New Haven.

FLORIDA: * *Examination.* Miami Beach, June 22-24. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami 36.

GEORGIA: *Examination and Reciprocity.* Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

GUAM: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agaña.

MAINE: *Examination.* Portland, March 10-12. *Endorsement.* Portland, March 10. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

MICHIGAN: * *Examination.* Ann Arbor and Detroit, June 8-10. Sec., Dr. E. C. Swanson, 118 Stevens T. Mason Bldg., West Michigan Ave., Lansing 8.

MINNESOTA: * *Reciprocity.* St. Paul, February. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul.

MONTANA: *Examination and Reciprocity.* Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEBRASKA: * *Examination.* Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: *Examination and Endorsement.* Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

NEW MEXICO: * *Examination and Reciprocity.* Santa Fe, May 18-19. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

NORTH CAROLINA: *Examination.* June Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

OKLAHOMA: * *Examination.* Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

PUERTO RICO: *Examination and Reciprocity.* San Juan, March 3. Acting Secretary, Dr. Herminio Mendez Herrera, Box 9156, Santurce.

SOUTH CAROLINA: *Reciprocity.* Columbia, May 12; *Examination.* Columbia, June 23-24. Sec., Dr. H. E. Jervey, Jr., 1829 Blanding St., Columbia.

TEXAS: * *Examination and Reciprocity.* Fort Worth, June 22-24. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination.* Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, May 4-5. Sec., S. C. Dellinger, University of Arkansas, Fayetteville.

CONNECTICUT: *Examination.* New Haven, Feb. 14. Exec. Asst., Mrs. Regina G. Brown, 258 Bradley St., New Haven 10.

FLORIDA: *Examination.* Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

KANSAS: *Examination.* Kansas City, June. Sec., Dr. L. C. Heckert, Pittsburg.

MICHIGAN: *Examination.* Ann Arbor and Detroit, Feb. 12-13. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., West Michigan Ave., Lansing.

OKLAHOMA: *Examination.* Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

RHODE ISLAND: *Examination.* Providence, Feb. 18. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TEXAS: *Examination.* April 1959. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination.* Madison, April 4. Final date for filing application is March 27. Milwaukee, June 6. Final date for final application is May 29. Sec., Mr. W. H. Barber, 621 Ransom St., Ripon.

*Basic Science Certificate required.

GOVERNMENT SERVICES

ATOMIC ENERGY COMMISSION

Brookhaven Medical Research Center.—The nation's newest atomic medical research center, including the world's first nuclear reactor designed specifically for medical use, was dedicated at Brookhaven National Laboratory, Upton, L. I., New York. In addition to the reactor, the new Brookhaven Medical Research Center includes a 48-bed hospital for research patients and laboratories for studies on medical applications of atomic energy. The medical research reactor, which is scheduled for operation early in 1959, includes unique design features for use in research treatment of ailing human beings and experimental animals.

AIR FORCE

School of Aviation Medicine.—On Feb. 9, 1959, the School of Aviation Medicine, Randolph Air Force Base, Texas, will commemorate the tenth anniversary of the founding of the department of space medicine. Major Gen. Harry G. Armstrong, former commandant of the school and a pioneer in aeromedical research, established the department, the first of its kind in the world. This school was the first to initiate a professorship of space medicine, presently held by Dr. Hubertus Strughold. To mark this important date, Major Gen. Otis O. Benson Jr., the present commandant, requested the original members of the department (which has since been expanded into a full division) to be on hand. With General Armstrong will be Drs. Strughold, Fritz Haber, Heinz Haber, and Konrad J. K. Buettner. After a tour of space medicine and space biological facilities at the school, General Benson will introduce the program. General Armstrong will then describe the organization of the department of space medicine; and Col. Paul A. Campbell, chief of the space medicine division, will discuss the present organization of the division and the general aspects of the space medical and space biological effort at the school. After this presentation, each of the four civilian scientists of the initial organization will discuss, in light of his own specialty, problems and predictions for space medicine and space flight of the next decade. To close the day, a banquet will be held at which the guest speaker will be Lieut. Gen. Roscoe C. Wilson, deputy chief of staff for development, Headquarters U. S. A. F., Washington, D. C.

ARMY

Medical Packet for Care of Mass Casualties.—An emergency medical packet for use in a mass casualty situation has been designed. Mass casualty situations occur whenever the number of persons injured is out of proportion to the medical resources available. The problems of mass casualty care are thus not confined to nuclear warfare but can result from fires, floods, hurricanes, and other civil disasters. The new packet, containing 23 items, will provide enough medical material to treat about 100 casualties for about 72 hours. It is, however, designed for much more than first aid. It has nine component cartons: two master packs containing a plasma substitute (Dextran) and miscellaneous items, one fracture pack, two burn packs, and four wound packs.

VETERANS ADMINISTRATION

Personal.—Dr. Robert J. Scott, director of professional services at the Veterans Administration Hospital at Richmond, Va., has been appointed manager of the VA hospital in Fort Wayne, Ind. Dr. Scott will succeed Dr. Michael H. Travers, who was recently appointed director of domiciliary homes for the VA in Washington, D. C.

FOOD AND DRUG ADMINISTRATION

Court Actions During November.—Contaminated foods seized during November totaled 244 tons. A major part of this volume was contaminated in warehouse storage. This included 12 tons of shelled walnuts, 6 tons of ginger root, 37 tons of flour, and 16 tons of raw popcorn. An additional 11 tons of foods, including vanilla beans without flavoring strength, watered-down orange juice, and substandard canned green beans, were seized as economic cheats. Of 25 drugs and devices seized in November, 13 were alleged to be misbranded by false and misleading claims. Five were vibrator-massage devices for which weight reduction claims were made. Altogether, 73 seizure cases were instituted.

Voluntary Corrective Actions.—During November, food firms voluntarily destroyed or converted to animal feed or nonfood use more than 291 tons of unfit foods; 116 tons of wheat on a barge were contaminated with oil. More than 50 tons of frozen foods were destroyed after spoilage because of a power failure in a cold storage warehouse. Food manufacturers spent an estimated \$595,387 in plant improvements to make sure of producing clean, wholesome products, as required by law.

DEATHS

Aleman, Ruth Gertrude ① New Orleans; born in Belle Alliance, La., Sept. 12, 1892; Medical College of Virginia, Richmond, 1924; served as a nurse in France with the American Expeditionary Forces during World War I; past-president of the New Orleans Catholic Physicians Guild and the Louisiana State Pediatric Society; once president of the Alpha Epsilon Iota, woman's medical fraternity; served as secretary of the New Orleans branch of the American Medical Women's Association; member of the American Academy of Pediatrics; for many years taught pediatrics at the Hotel Dieu School of Nursing; at one time served as clinical instructor in pediatrics at the Tulane University Graduate School of Medicine; served as instructor in pediatrics at the Louisiana State University School of Medicine; past-president of the medical staff, Hotel Dieu. Sisters' Hospital; for many years associated with the Charity Hospital, Mercy Hospital, and the St. Vincent's Infant Asylum, where in 1939 she was named medical director; in 1945 commissioned a senior surgeon in the U. S. Public Health Service Reserve; died Nov. 18, aged 66.

Birkenstock, Carl Frederick ① San Diego, Calif.; College of Medical Evangelists, Loma Linda and Los Angeles, 1923; L. R. C. P., of Edinburgh, L. R. C. S., Edinburgh, and L. R. F. P. & S., Glasgow, 1923; member of the International College of Surgeons and the American Academy of General Practice; formerly a medical missionary in South Africa; certified by the National Board of Medical Examiners; served on the staff of the Paradise Valley Hospital in National City, where he was once chief of staff; died in the Sharp Memorial Hospital Nov. 9, aged 61.

Bishop, Elizabeth Ellen, Pendleton, Ore.; University of Oregon Medical School, Portland, 1937; specialist certified by the American Board of Preventive Medicine; past-president of the Oregon Public Health Association; formerly health officer of Union and Baker counties; at one time associated with the Alaska Department of Health in Juneau; died Nov. 6, aged 46.

Botkin, Amos Watts, Oregon City, Ore.; Willamette University Medical Department, Salem, 1890; Jefferson Medical College of Philadelphia, 1893; veteran of World War I, formerly practiced in Gresham, where he was active in civic affairs and for 12 years was a city councilman and a member of the school board; died in the Veterans Administration Hospital, Portland, Nov. 25, aged 94.

Broach, Norman Leslie, Pine Level, Ala.; Atlanta School of Medicine, 1909; member of the Medical Association of the State of Alabama; associated with the St. Margaret's Hospital, Montgomery, where he died Nov. 18, aged 77.

Burkle, George Henry Jr. ① Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1930; formerly on the faculty of his alma mater; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; for many years on the staff of St. Joseph Hospital; on the courtesy staffs of the Methodist Hospital, Baptist Hospital, and City of Memphis Hospitals; died Nov. 18, aged 54.

Buschle, Donald Francis ① Syracuse, N. Y.; Syracuse University College of Medicine, 1949; clinical assistant professor of anesthesiology at his alma mater, now known as the State University of New York College of Medicine; certified by the National Board of Medical Examiners; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists; on the staff of St. Joseph's Hospital, where he died Nov. 14, aged 32.

Byas, John Vick, Memphis, Tenn.; Meharry Medical College, Nashville, Tenn., 1909; died Nov. 5, aged 78.

Casagrande, Annibale, New York City; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1923; associated with the Manhattan General Hospital and the Beekman-Downtown Hospital; died in the Medical Arts Center Hospital Nov. 11, aged 58.

Clarke, Eric Kent ① Lynn Haven, Fla.; born in Portsmouth, Ont., Canada, May 28, 1894; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1916; served on the faculty of his alma mater, University of Rochester (N. Y.) School of Medicine, University of Minnesota Medical School in Minneapolis, and the University of Minnesota Graduate School, Minneapolis-Rochester; a captain in the Canadian Medical Corps during World War I; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association and the Ohio State Medical Association; formerly psychiatrist for the bureau of health and board of education in Rochester, N. Y., where he was at one time associated with the Strong Memorial Hospital; from 1954 to 1956 medical director of the Erie County

① Indicates Member of the American Medical Association.

Guidance Center in Sandusky, Ohio; author of "Mental Hygiene for Community Nursing"; died in Panama City. Nov. 19, aged 64.

Clemens, Harry Herschel ® Pasadena, Calif.; born in Toronto, Ont., Canada, July 22, 1910; University of Louisville School of Medicine, Louisville, Ky., 1937; specialist certified by the American Board of Pediatrics, Inc.; member of the American Academy of Pediatrics; instructor in pediatrics at the University of Southern California School of Medicine in Los Angeles; served an internship at the Louisville City Hospital in Louisville, Ky., where he served a residency in bacteriology; formerly a resident at the Grady Hospital in Atlanta, Ga., Willard Parker Hospital in New York City, and the Rawlings Sanitarium in Sandersville, Ga.; associated with the Los Angeles County Hospital in Los Angeles, Collis P. and Howard Huntington Memorial Hospital, and St. Luke Hospital, where he died Aug. 14, aged 48.

Conklin, James Edward Jr. ® Sacramento, Calif.; University of Southern California School of Medicine, Los Angeles, 1939; member of the American Academy of General Practice; veteran of World War II; on the staffs of the Mercy and Sutter hospitals; died Nov. 27, aged 48.

Davis, Luther, Tucson, Ariz.; University of Tennessee College of Medicine, Memphis, 1912; died in St. Mary's Hospital Nov. 13, aged 73.

De Rouen, Robert Francis, New Iberia, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1908; past-president and vice-president of the Louisiana Coroners' Association; for many years coroner of Iberia Parish; served as state representative; died Nov. 8, aged 91.

Edmond, Courtney ® Clifton Forge, Va.; University College of Medicine, Richmond, 1903; fellow of the American College of Surgeons; served as vice-president of the Virginia Society of Otolaryngology and Ophthalmology; served on the city council; associated with the Chesapeake and Ohio Hospital; died Nov. 2, aged 82.

Edyvcan, William Henry, Deadwood, S. D.; Université de Lausanne Faculté de Médecine, Switzerland, 1955; veteran of World War II; interned at Weld County General Hospital in Greeley, Colo.; died Nov. 13, aged 51.

Feith, Victor, New York City; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1912; member of the Medical Society of the State of New York; died in the North Shore Hospital Oct. 5, aged 71.

Gandy, Charles Lewis ® Colonel, U. S. Army, retired, Mesilla Park, N. M.; born in Fort Concho, Texas, Jan. 24, 1889; University of Michigan De-

partment of Medicine and Surgery, Ann Arbor, 1912; honorary graduate and medalist, Army Medical School in 1914, when he entered the regular Army; rose through the various grades to that of colonel in 1940; served in the occupation of Germany during World War I, and the occupation of Japan in World War II; served two overseas tours in the Philippine Islands; retired Jan. 31, 1949; college physician, New Mexico College of Agriculture and Mechanical Arts, State College; fellow of the American College of Surgeons; died Nov. 12, aged 69.

Gilbert, Joseph Le Roy ® Washington, D. C.; born in Bellefourche, S. D., Aug. 9, 1890; Creighton University School of Medicine, Omaha, 1919; specialist certified by the American Board of Psychiatry and Neurology; fellow of the American College of Physicians; past-president of the Washington Society of Nervous and Mental Diseases; member of the American Psychiatric Association and the Washington Psychiatric Society; served on the faculty of the Washington School of Psychiatry, as chief psychiatrist at the Gallinger Municipal Hospital, now known as the District of Columbia General Hospital, and as alienist for the District of Columbia; served as chief of service, Department of Health, Education and Welfare; member and trustee, William Alanson White Foundation; chief of service, St. Elizabeth's hospital, where he died suddenly at his desk Nov. 13, aged 68.

Golden, Thomas Kernan ® Youngstown, Ohio; Georgetown University School of Medicine, Washington, D. C., 1928; fellow of the American College of Surgeons; on the staffs of the Central Clinic and Hospital and Salem City Hospital in Salem, Mahoning Tuberculosis Sanatorium, and St. Elizabeth Hospital, where he died Nov. 19, aged 54.

Graves, James Quintus ® Monroe, La.; born in Columbia, March 17, 1878; Medical Department of Tulane University of Louisiana, New Orleans, 1906; past-president of the Fifth District Medical Society and the Surgical Association of Louisiana; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; served 27 consecutive years as a member of the House of Delegates of the American Medical Association, and was a member of its Council on Medical Service; on the staff of St. Francis Hospital, where in 1956 a golden anniversary dinner was held, honoring him on the occasion of his 50 years in the practice of medicine; an operating room at the hospital was dedicated to him; died Nov. 10, aged 80.

Hanlon, Morgan Patrick ® Springfield, Mass.; Tufts College Medical School, Boston, 1917; member of the American Society of Anesthesiologists, Inc.; veteran of World War I; on the staff of the Mercy Hospital; died Nov. 16, aged 64.

Hunter, William Gordon @ Carson City, Nevada; University of Georgia Medical Department, Augusta, 1913; veteran of World War I; died Nov. 2, aged 70.

Kammerling, Theodore Simon @ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; served on the staff of the Chicago Eye, Ear, Nose and Throat Hospital; died in a nursing home at Bellwood Nov. 20, aged 77.

Keith, Charles Frank @ Williams, Calif.; University of California School of Medicine, San Francisco, 1921; veteran of World War I; died in the Colusa (Calif.) Memorial Hospital Nov. 5, aged 63.

Kerr, John Cleon, St. Petersburg, Fla.; University of Pittsburgh School of Medicine, 1912; at one time on the faculty of his alma mater; member of the West Virginia State Medical Association and the American Academy of Dermatology and Syphilology; an associate member of the American Medical Association; past-president and secretary of the Harrison County (W. Va.) Medical Society; served overseas during World War I; formerly practiced in Clarksburg, W. Va., where he was on the staffs of the St. Mary's and Union Protestant hospitals; died in the Mound Park Hospital Nov. 20, aged 71.

Kline, Edith Cordelia, Columbus, Ohio; Woman's Medical College of Pennsylvania, Philadelphia, 1905; member of the Ohio State Medical Association; died Nov. 6, aged 82.

Kneedler, Harry Dome, Berkeley, Calif.; Beaumont Hospital Medical College, St. Louis, 1892; veteran of the Spanish-American War and the Boxer Rebellion; among the persons interned by the Japanese in Manila during World War II; died Nov. 5, aged 88.

Kuhlman, Harry H., Phoenix, Ariz.; University of Southern California School of Medicine, Los Angeles, 1952; served a residency at the Margaret Hague Maternity Hospital in Jersey City and the North Carolina Memorial Hospital in Chapel Hill; veteran of World War II and later served in the medical corps of the U. S. Air Force; associated with St. Joseph's Hospital, where he served a residency and an internship; died Nov. 9, aged 35.

Landry, Wallace James Jr. @ New Orleans; Louisiana State University School of Medicine, New Orleans, 1947; specialist certified by the American Board of Radiology, Inc.; president-elect of the New Orleans Radiological Society; instructor in radiology at the Tulane University School of Medi-

cine; associated with the Mercy Hospital and the Charity Hospital, where he served an internship and residency; died Nov. 15, aged 44.

Langsdon, Fred Ronald @ Gaston, Ind.; Indiana University School of Medicine, Indianapolis, 1922; veteran of World War I; town health officer and school physician; served as chief of staff, Ball Memorial Hospital in Muncie; died Nov. 2, aged 65.

Janier, Raymond Ray @ Denver; Washington University School of Medicine, St. Louis, 1944; head of the department and professor of radiology at the University of Colorado School of Medicine; served an internship and residency at the University of Chicago Clinics in Chicago, where he was instructor of roentgenology, 1948-1949, and assistant professor of roentgenology, 1949-1950; an officer in the medical corps, Army of the United States, from 1946 to 1948 serving as chief of x-ray at the 179th Station Hospital and 183rd General Hospital in Alaska; member of the Radiological Society of North America and the American College of Radiology; served as president of the Colorado Radiological Society; associated with the Colorado General, Denver General, St. Joseph's, Swedish, and the National Jewish hospitals; died in the Holyoke (Colo.) Hospital Nov. 24, aged 44.

Leddy, Donald Valentine @ Ridgewood, N. J.; born in New York City, Feb. 14, 1923; Georgetown University School of Medicine, Washington, D. C., 1948; interned at the Walter Reed Army Hospital in Washington, D. C., where he served a residency in psychiatry; certified by the National Board of Medical Examiners; member of the American Psychiatric Association; first lieutenant in the officers' reserve corps from 1948 to 1951, when he transferred to the medical corps of the regular Army; resigned his commission as lieutenant colonel in 1957, after serving for three years in Germany; associated with St. Joseph's Hospital in Paterson and the Valley Hospital; died in the New York Hospital, New York City, Nov. 7, aged 35.

Levinson, Marvin Seymore, Chicago; Chicago Medical School, 1954; certified by the National Board of Medical Examiners; formerly an officer in the U. S. Naval Reserve; interned at the Cook County Hospital; served a residency at the Michael Reese Hospital, where he died Nov. 21, aged 29.

Lewy, Alfred @ Chicago; born in Wetumpka, Ala., April 9, 1873; Chicago Homeopathic Medical College, 1897; Rush Medical College, Chicago, 1898; later studied in Berlin, Germany; specialist certified by the American Board of Otolaryngology; at one time on the faculty of the General Medical College; member of the American Academy of Ophthalmology and Otolaryngology and the American Otological Society; served as vice-president of the American Laryngological, Rhinological and

Otological Society; past-president of the Chicago Laryngological and Otological Society; fellow of the American College of Surgeons; assistant city physician for the City of Chicago for 50 years; formerly consultant to the Home for the Friendless; for many years attending otolaryngologist at the Illinois Charitable Eye and Ear Infirmary, attending otolaryngologist at the Cook County Hospital, and staff member of the Chicago Memorial Hospital; contributed numerous articles to the medical journals; died in the Michael Reese Hospital Dec. 14, aged 85.

Lovett, Irving Kennedy, Red Bank, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1916; member of the Medical Society of New Jersey; veteran of World War I; served in the regular Army; associated with the Monmouth Memorial Hospital in Long Branch and the Riverview Hospital; died Nov. 2, aged 68.

McGhee, John B. @ Chattanooga, Tenn.; Medical Department of Grant University, Chattanooga, 1894; died in the Baroness Erlanger Hospital Nov. 5, aged 85.

Mace, Vernie Emmett, Huntington, W. Va.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1930; veteran of World War I; on the staff of the Huntington State Hospital; formerly on the staff of the Weston State Hospital; died Nov. 23, aged 61.

Mahoney, Daniel Francis Collins, Redlands, Calif.; Georgetown University School of Medicine, Washington, D. C., 1924; member of the California Medical Association; veteran of World War I; died Oct. 31, aged 62.

Makel, Hertel Philip @ Colonel, U. S. Army, retired, Moorestown, N. J.; Johns Hopkins University School of Medicine, Baltimore, 1915; service member of the American Medical Association; fellow of the American College of Physicians and the American College of Surgeons; veteran of World Wars I and II; entered the regular Army in 1918 as a first lieutenant; rose through the various grades to that of colonel in 1943; retired Sept. 30, 1946 for disability in line of duty; died in the Veterans Administration Hospital in Lyons Nov. 7, aged 70.

Massa, Anthony, Boston; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1915; a medical officer with the Italian Army during World War I; died in the New England Deaconess Hospital Nov. 2, aged 71.

Matousek, William Joseph @ Glendale, Calif.; Rush Medical College, Chicago, 1921; a recipient of the Silver Beaver and Silver Antelope Awards for distinguished service to the Boy Scouts; in 1952 named to the advisory committee of the National Board

of Boy Scouts; associated with the Memorial Hospital, where he served as president of the staff; named the "Physician of the Year" in Glendale in 1949 by the Glendale Branch of the Los Angeles County Medical Association; died Nov. 21, aged 69.

Means, Philip Corydon, Chula Vista, Calif.; born Oct. 11, 1872; Harvard Medical School, Boston, 1902; specialist certified by the American Board of Otolaryngology; veteran of World War I; past-president of the Kent County (R. I.) Medical Society and the Santa Barbara County Medical Society; member of the Association of Military Surgeons of the United States; for many years practiced in Santa Barbara, where he was past-president of the school board, and on the staffs of the St. Francis and Santa Barbara Cottage hospitals; formerly practiced in Merrimac, Mass., where he was on the school board; died in San Diego Nov. 3, aged 86.

Mendenhall, Arthur Junnius @ Los Angeles; Marquette University School of Medicine, Milwaukee, 1937; interned at the California Hospital; veteran of World War II; chief of staff of the French Hospital; died in St. Vincent's Hospital Nov. 2, aged 54.

Meyers, Daniel, Portland, Ore.; Medico-Chirurgical College of Philadelphia, 1913; also a graduate in pharmacy; died in the Good Samaritan Hospital Nov. 2, aged 70.

Miller, Minnie Ethel Reid, Blackwell, Okla.; Kansas City (Mo.) Homeopathic Medical College, 1901; died Nov. 17, aged 82.

Moore, George Albert @ East Bridgewater, Mass.; born in North Monroe, N. H., Dec. 22, 1878; Harvard Medical School, Boston, 1911; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; at one time director of the Massachusetts division of the American Cancer Society; served in France during World War I; for many years associated with the Moore Hospital, of which he was a founder and medical superintendent; served on the staff of the Brockton (Mass.) Hospital; consultant, St. Luke's Hospital and Lakeville State Sanatorium in Middleboro, Bridgewater (Mass.) Hospital, Plymouth County Hospital, South Hanson, Jordan Hospital in Plymouth, and the Veterans Administration Hospital in Brockton; died Nov. 3, aged 79.

Souther, Robert Fulton, Gloucester, Mass.; Boston University School of Medicine, 1899; formerly associated with the Veterans Administration Hospital in New York City; died in the Veterans Administration Hospital in Boston Sept. 25, aged 82.

Wesenberg, William Robert @ Mound City, Ill.; Vanderbilt University School of Medicine, Nashville, Tenn., 1912; died in St. Mary's Hospital, Cairo, Oct. 24, aged 71.

FOREIGN LETTERS

FRANCE

Soya Oil and Cholesteremia.—R. Wolff and co-workers (*Presse méd.* 66:1706, 1958) found that soya oil had a high iodine number and could have a hypocholesteremic action because of its degree of nonsaturation and its abundance of β -sitosterol. Five lots of six to eight rabbits each were subjected to a special feeding with 3 ml. of soya oil per kilogram of body weight. The duration of this diet did not exceed eight days. As early as the next day after the administration of soya oil, a drop in serum cholesterol to about 73% of the initial value was noted. Clinically, 15 subjects, aged from 50 to 70 years, were given 1.5 cc. of soya oil before each of the two main meals. In six subjects for whom the diet was continued for only 6 to 11 days, a constant fall of the total cholesterol to about 84% of the initial value was noted. In nine subjects in whom the administration of soya oil was of longer duration (average 63 days), the findings were heterogenous and difficult to interpret. Despite the abundance of nonsaturated fatty acids and fatty acids of the essential type, the action of soya oil on cholesteremia was questionable. Factors other than the nonsaturation of the fats must determine the blood cholesterol level.

Cardiovascular Accidents from Asthma.—J. Turiaf and co-workers (*Presse méd.* 66:1543, 1958) analyzed a series of 747 patients with asthma and found it was mainly the 40-to-50-year-old man with asthma, whatever his occupation, who was threatened (in the ratio 4:1 as compared with women of the same age group) by cardiovascular accidents. Cardiac insufficiency is favored by continuous dyspnea; frequent, prolonged, and violent paroxysms; and profuse and infectious bronchial catarrh. Infrequent and intermittent asthmatic attacks do not affect severely the cardiovascular system but at most may produce slight rotation and deviations in the electrical axis. Such conditions as acute cor pulmonale, cardiovascular collapse, and right or left myocardial ischemia without peripheral evidence of cardiac embarrassment are exclusively related to the status asthmaticus. Right auriculoventricular hypertrophy and chronic insufficiency of the right heart are related to asthma with continued dyspnea. Acute cor pulmonale (4% of the patients with status asthmaticus) may be cured without sequelae by treatment of the status asthmaticus.

Myocardial ischemia (1% of the patients with status asthmaticus) may be asymptomatic and diagnosed only by electrocardiography. It may be cured by treatment of the status asthmaticus. Cardiovascular collapse (12% of the patients with status asthmaticus) is a severe accident, not necessarily developing on the basis of acute or chronic cardiac insufficiency.

Exudative pericarditis is rarely seen. Auriculoventricular hypertrophy (18% of the patients) is a real emergency but not necessarily relevant to established chronic cor pulmonale. Chronic cor pulmonale (5.4% of the patients) shows the usual features of that cardiac insufficiency which is a complication of bronchopneumopathy unrelated to asthma. Pulmonary arterial hypertension, subsequent to the alveolar anoxia, and also the vascular disorders of vasomotor and allergic origin are the essential sources of cardiac accidents in the asthmatic patient. Treatment of cardiac affections due to asthma should aim at restoring the bronchial ventilation, the impairment of which produces pulmonary arterial hypertension and humoral disorders (anoxemia, hypercapnia, gaseous acidosis, and electrolytic imbalance). The prevention of cardiovascular accidents from asthma is dominated by the rational treatment of the asthma itself, the allergy, and the bronchial infection. The "alarm-status" is a formal indication for the use of delta-cortisone. The treatment of cardiovascular accidents from asthma is based on the use of delta-cortisone or ACTH, combined in the case of status asthmaticus with blood-letting, in the case of bronchial infection with antibiotics, and in the case of impairment of gaseous exchange and blood pH with oxygen and acetazolamide. Cardiovascular collapse requires a tracheotomy prior to artificial respiration, then slow venous infusions of ACTH and levarterenol. Delta-cortisone operates through restoration of the pulmonary ventilation, diuretic effect by direct action on the kidney, and antiallergic protection.

Allergy to Ricinus Plant.—R. Panzani (*Presse méd.* 66:1788, 1958) reported a series of 152 patients (101 adults and 51 children) with respiratory allergy to the castor oil plant, of which 132 had asthma, 16 spasmodic coryza, and 4 bronchial spasm. In 15 patients the allergy was isolated, but in the others it was combined with an allergy to dust, mildew, linseed, or cottonseed. All of the patients were living either in Marseilles where there are castor oil factories, or in southeastern France

where ricinus cakes are used as fertilizer for vegetable gardening. A positive scratch-test with ricinus extract always indicated allergy to this plant. The author recognized three clinical forms of allergy: (1) that occurring in persons exposed to ricinus in their occupation or their lodging (15 cases); (2) that combined with an allergy to dust or mildew in persons also particularly exposed (26 cases); and (3) a combined allergy in persons with no intensive exposure (111 cases). In the first two groups the prognosis was unfavorable unless the patient was able to change lodging or occupation. In the third the prognosis was favorable in 95 patients, but the remaining 16 were compelled to leave those regions contaminated with ricinus. Treatment consists in removing the patient from these contaminated regions and also in desensitizing him.

INDIA

Pallor as Test for Anemia.—Saxena and Kavathekar (*Journal of the Indian Medical Profession*, vol. 5, August, 1958) studied 200 factory workers who complained of general debility and pallor of the skin of the face, conjunctiva, and nails. Most of them had to do hard manual labor and belonged to about the same social and economic group. Their ages varied between 20 and 45 years. Respiratory diseases other than tuberculosis (mostly nasal and bronchial catarrh) were found in 22.5%, fever (mostly malaria) in 20%, no organic diseases in 16.2%, gastrointestinal diseases in 12.5%, tuberculosis in 6.5%, and miscellaneous diseases (cutaneous, venereal, and dental) in the rest. Hematological examination was normal in 56.5% despite the obvious pallor. The rest had macrocytic hypochromic anemia. Most of these patients were used to a diet deficient in certain factors which may account for the hypochromia while the presence of chronic gastritis and lack of erythrogenic factors may have been responsible for the macrocytosis. Most of the patients with debility showed an increase in the erythrocyte count and packed cell volume and a hyperchromia. These findings may have been due to dehydration leading to hemoconcentration, or the hemoconcentration may have been part of the reaction to chronic stress. An increased sedimentation rate was also found in most of these patients and may also have been due to chronic stress.

Occupational Health Conference.—Inaugurating the second Asian Conference of Occupational Health in Calcutta in November, the State Health Minister stated that occupational health should concern itself not only with the prevention of disease and reduction of industrial hazard but also with the promotion of educational programs among the workers because physically and mentally alert workers are an asset to any industry. Illness cannot be divorced from the social environment and mental

climate in which a man lives. Occupational health should therefore pay attention to the need for team work in such fields as medicine, psychology, and personnel management. The need for this was indicated by the fact that occupational diseases accounted for only 10% of man-days lost in industry while nonindustrial diseases and injuries accounted for 90%. The problem common to all Asian countries is rapid unplanned urbanization resulting in acute housing shortages. Another problem in Asia is the rapid growth of population. India is one of the few countries which has accepted a policy of family planning. The death rate in most countries has declined on account of improved health conditions but there has been no corresponding fall in the birth rate and this poses a serious problem.

SWEDEN

Blood Flow Studies.—Robin Fåhræus (*Nordisk medicin*, vol. 60, Oct. 23, 1958) stated that reduced suspension stability of the blood or slowing down of its flow gave rise to visible aggregation of the erythrocytes in the small vessels (granular flow or sludging). In the wider arterioles the intravascular aggregation produces a more concentrated axial stream of the erythrocytes and a broader marginal stream of the plasma. The consequence of this is that the transport of the red cells is accelerated at the expense of that of the plasma, and the viscosity of the blood is reduced. On the other hand, the aggregates of the erythrocytes offer a resistance to the blood flow in the narrower arterioles and at the entrance to the capillaries. This was proved by measuring this resistance through determining the filterability of the erythrocytes. This filterability was decreased in proportion to the increase in the sedimentation rate. When the suspension stability is reduced, aggregates of red blood cells block the smallest vessels and cause tissue damage.

New Laxative.—Dulcolax (4,4-diacetoxy-diphenyl=pyridyl-2= methane) was used by Ole Eklöf (*Nordisk medicin*, vol. 60, Oct. 30, 1958) on 148 unselected outpatients in preparation for x-ray examination. It was given orally and rectally instead of the conventional castor oil and enemas. The results were encouraging in about 67% of the patients. In only nine was further cleansing by enema necessary. In 28 of 41 patients who had been previously examined with use of the conventional purgation, the result with Dulcolax appeared to be better than or as good as those observed earlier. The preparation provided a simple form of purgation. It was particularly suitable for outpatients and was time-saving for the x-ray department of the Karolinska Hospital in Stockholm.

Antihistamine for Burns.—The effect of antihistamine treatment on the urinary excretion of histamine, catechol amines, and adrenocortical steroids, and

on the elimination of dextran and serum albumin was studied in nine severely burned patients by G. Birke and co-workers (*Acta chirurgica scandinavica*, vol. 115, 1958). No effect was observed with the promethazine treatment on the amount of histamine in the blood and urine. The urinary excretion of epinephrine was as high as in those not treated with promethazine during the first day after the accident but during the second day was significantly lower. The amount of levarterenol showed no significant difference in the two series. The excretion of corticosteroids was within normal limits, and significantly lower than in the patients treated without promethazine. The elimination of dextran and serum albumin was within the same range as in those not treated with an antihistamine. The significantly lower excretion of corticosteroids even on the second and fifth days in the promethazine-treated patients might be taken to indicate the favorable effect of antihistamine in severe burns.

Angiography of the Thigh.—Stener and Stener (*Acta chirurgica scandinavica*, vol. 115, 1958) reported on five cases of malignant tumors of the soft tissues of the thigh which were subjected to angiography before operation. They believe that this examination could in many cases strongly reinforce suspicions of malignancy, though it could not remove them. One advantage of angiography is that it can be used for preoperative localization of the tumor. Temporary occlusion of the common iliac artery may be indicated in certain patients in whom incisional biopsy for frozen section is taken in connection with the definitive operation. The purpose of this measure is to lessen the risk of disseminating tumor cells in the operative field. The resultant bloodless field also facilitates exact operative technique.

Hypocalcemia and Acute Pancreatitis.—R. E. Lilljekvist (*Acta chirurgica scandinavica*, vol. 115, 1958) investigated the diagnostic value of blood calcium determinations (1) in acute pancreatic necrosis associated with a normal urine diastase level, (2) as a means of differentiating pancreatic necrosis and other types of acute pancreatitis, and (3) in excluding pancreatic necrosis in patients with acute upper abdominal diseases with or without increased diastase activity. He studied 98 patients with suspected biliary and/or pancreatic tract diseases and made simultaneous blood calcium and urine diastase tests. Nothing was found to indicate that changes in blood calcium could be caused by cholecystitis, bile duct obstruction, or operation per se, when not complicated by acute pancreatic necrosis.

The blood calcium values were consistent with the clinical signs. Of the 11 most severely ill patients, with clinical signs suggestive of pancreatic necrosis, 10 had hypocalcemic levels on one or more occasions. The 11 in whom autopsy revealed a hemorrhagic pancreatitis without necrosis had a

normal blood calcium supporting the suggested pathogenesis of hypocalcemia in acute pancreatic necrosis. In five patients with evidence of acute pancreatitis (though less severe than would indicate pancreatic necrosis) no lowered blood calcium values were obtained. In only two patients were unexplained low calcium levels found and in one of these the diagnosis could possibly have been relapsing acute pancreatitis. In one of the 10 patients with hypocalcemic levels, the urine diastase content remained normal; in 4 an initial rise returned to a normal level with the onset of hypocalcemia; in 8 the hypocalcemia persisted longer than the diastase elevation; in 2 in whom exacerbation of an acute pancreatic necrosis was suspected, the blood calcium level became once more subnormal while the diastase values remained within normal limits.

The author concluded that pancreatic necrosis as a rule lowered the blood calcium level directly proportional to the extent of the necrosis. It is suggested that blood calcium determinations provided a better indication as to the development of this disease than urine diastase tests. Furthermore, the conditions causing elevated urine diastase output of nonpancreatic origin did not produce hypocalcemia, and conditions causing hypocalcemia of nonpancreatic origin did not increase diastase values. Thus blood calcium determinations should be considered a valuable complement to the diagnostic tests used in patients with acute upper abdominal diseases.

UNITED KINGDOM

New Drug for Leprosy.—At the British Pharmaceutical Conference in Llandudno Dr. F. L. Rose stated that a new drug, Etisul (diethyl dithiol isophthalate), is effective in the treatment of leprosy. Trials were made by Dr. T. Davey, head of the Nigerian Leprosy Service Research Unit, Uzuakoli, who found that it was active when administered by inunction. The drug was said to have no toxic side-effects and to produce sufficient clinical improvement within three months to permit the discharge of the patient from the leprosarium without danger to others. It was found by Rose and co-workers that compounds liberating ethyl mercaptan in the body had an antituberculous action. A search was then made for a safe, odorless, and quickly absorbed drug capable of releasing this compound in the body. Over 400 compounds were synthesized and screened before Etisul was prepared. It was found to have positive antituberculous activity and this was regarded as useful indirect evidence of an antileprotic action. Administration of Etisul by inunction avoids the pain of injection and the formation of the distasteful and unpleasant-smelling ethyl mercaptan. The small amounts of this that are formed in the ointment are masked by a suitable scent.

The Nation's Health.—Sir John Charles of the Ministry of Health (Report of the Ministry of Health for 1957, pt. II, Her Majesty's Stationery Office, London) stated that although tranquilizers may be of great benefit in mental hospitals, their indiscriminate use can do much harm. Apart from the complications and side-effects that may occur, the regular use of either sedatives or tranquilizers can lead to physical and psychic dependence. One test of a mature personality is the capacity to face reality and tackle difficult situations with courage and determination. These qualities are ignored if tranquilizers are used too freely.

On new drugs the report states that, despite the usual procession of new drugs appearing on the market, it is doubtful that more than a few will make a lasting contribution to medical progress. There has been a sober reassessment of various forms of treatment, many of which were embraced enthusiastically on their introduction but have failed to live up to their initial promise. Regarding antibiotics the current problem is not so much the need for new ones as the too liberal prescribing of those already available for minor conditions from which spontaneous recovery is expected. Sir John adopted a skeptical attitude toward the treatment of diabetes with orally administered drugs and leveled criticism at the type of research carried out by the pharmaceutical companies. "It may be worth while considering whether the amount of effort now being applied to *ad hoc* drug studies, designed in most cases to produce quick results, is not disproportionately large in relation to scientific investigations of a more fundamental nature on which the long-term advance of medicine depends."

Recent outbreaks of typhoid have been associated with an unusual strain of *Salmonella typhi*, and infected oysters have been incriminated as one of the causes of spread. There were four cases of smallpox, two resulting in death; a case of indigenous malaria, the first for three years; and five cases of tetanus from one area. Only 43% of infants under one year of age received primary vaccination against smallpox. There was a steep rise in the number of new cases of gonorrhea in both sexes—from 16,377 to 19,620 in men, and from 4,011 to 4,761 in women. It is now apparent that penicillin, effective as it has been, cannot by itself make a lasting impression on this disease. There is a misplaced faith in the one-injection treatment, with failure to attend the clinic for follow-up examinations. The number of reported cases of scarlet fever fell below 30,000 for the first time; the rates in some rural areas fell to as low as 5 per 100,000. Reporting of this disease is of epidemiologic value as it is an index of the extent of streptococcal infection. In some outbreaks of sore throat without a rash nephritogenic strains of streptococci were

isolated, and in at least one area penicillin was given prophylactically to those in close contact with the disease.

The incidence of lung cancer continues to rise. This disease and automobile accidents pose the two greatest public health problems. Deaths from bronchogenic cancer in men rose to 16,430, or 815 more than in the previous year. This is an increase of 5.2%. There were 2,689 deaths from this disease in women, an increase of 118 over the previous year.

The crude death rate of 11.5 per 1,000 is believed to be about as low a figure as can be expected. The increase of births over deaths, 208,511, was the highest in eight years. In his introduction Sir John states that human relations might be improved in some hospitals, where some of the staff adopt a too impersonal attitude toward the patients. This is attributed to the pressure of work rather than to any intentional neglect.

Aldosterone Antagonists for Ascites.—Patients with cirrhosis of the liver have a tendency to develop ascites. When ascitic fluid accumulates, very little sodium is excreted, while potassium excretion remains relatively normal. As this is the pattern found in hyperaldosteronism, and as many patients with cirrhosis of the liver excrete large amounts of aldosterone, Sherlock and co-workers (*Lancet* 2:1084, 1956) treated the condition with aldosterone antagonists. A new steroid, 17-spirolactone, with anti-aldosterone activity, SC 8109, was used for this purpose. It was given to three patients with hepatic cirrhosis and intractable ascites that did not respond to bed rest, sodium restriction, and diuretics. The patients were given a diet containing a constant amount of sodium, potassium, and protein and a fixed fluid intake of 1,800 ml. daily. Injections of 250 mg. of SC 8109 were given twice daily for five days. A sodium and water diuresis occurred in two of the patients. Intramuscular injection of a microcrystalline preparation was tried. This resulted in slow absorption of the steroid, the maximum effect being obtained about a week after treatment was started. Some activity was detected even after two weeks.

Centenary of the General Medical Council.—The General Medical Council of Great Britain celebrated its centenary on Nov. 23, a date which marked the first practical step toward a united and well-organized medical profession in Britain. It was brought into being by the Medical Act of 1858, which was introduced to enable the public to distinguish between qualified and unqualified practitioners and to regulate the education and qualifying examinations of physicians. The Council also maintained a register of physicians and laid down a code of ethics to be observed. Failure to comply with these rendered the offender liable to exclusion from the register. This could be done for canvas-

sing patients, employing or associating with unqualified assistants, conviction by a civil court for criminal offenses, and illicit relations with patients. Until recently there was no legal appeal against a decision of the Council, which has always been loath to drop a name from the medical register. For this reason an ingenious system of probation was introduced in 1882, based on postponement of judgment for a fixed period. This permitted the offender to reform his ways. It is now possible to appeal to the courts against a decision of the Council. The Council has done much for medical education and one of its early tasks was to prepare the first British Pharmacopoeia, to replace the three pharmacopoeias that were being used in Scotland, Ireland, and England and Wales.

Army Trains Medical Soldiers.—At a meeting in the British Medical Association Hall Major General W. D. Hughes, Commandant of the Royal Army Medical College, stated that although in the past the acceptable interval between wounding and surgical intervention had been taken to be six to eight hours, we must now accept an interval of up to eight days during which casualties must survive with the medical resources immediately available. Mass casualties can be divided into five groups, four according to the site of injury (head, chest, abdomen, and limbs), and one for all burns. What is needed is not a team of nursing specialists but highly trained, general nursing orderlies. In the training of such orderlies an entirely new approach is being used. No attempt is made to thrust the theory of anatomy and physiology down their throats. Instead, 24 nursing procedures have been defined and incorporated in the training program. Trainees take an enormous interest in these procedures. Trained orderlies now provide the skilled nursing element of the new Army field medical companies. These mobile companies, designed for handling mass casualties, have a strength of 48 (all ranks) and 100 beds. They can care for 100 casualties for eight days.

Antihistamines for Thermal Injuries.—Wilhelm and Mason (*Brit. M. J.* Nov. 8, 1958) stated that mild heat treatment of the skin of the guinea pig is followed by prompt but short-lived increase in vascular permeability which is mediated by histamine. With moderate heat treatment the prompt response is followed by a longer, delayed response which is mediated neither by histamine nor by any other recognized endogenous permeability factor. If man reacts in the same way, a substantial liberation of effective histamine would be expected only after a mild burn with no ostensible damage to or rupture of the skin; little or none would follow moderate or severe burns, owing to changes in the tissues that either inhibit histamine liberation, restrain the movement of liberated histamine to susceptible

blood vessels, or otherwise alter the capacity of the vessels to manifest a permeability effect. Since the histamine effect lasts only 10 minutes, in any efficient treatment of mild burns by an antihistamine the drug would have to be applied within a few minutes, either locally in a form capable of rapid penetration of unbroken skin or intravenously. Moreover, since the intensity of the delayed vascular response observed was not diminished when the early histamine effect was neutralized, the antihistamine would do nothing to inhibit these delayed effects, even supposing the burn were severe enough to induce them; but histamine liberated and held in the tissue of more severe burns might later be released to the detriment of surrounding tissues, and consequently prophylactic antihistamine might diminish later deleterious responses to the injury.

Radiation Danger.—According to Sir John Cockcroft a great deal was learned in the last three years from three reactor accidents which led to partial melting out of the reactor fuel elements. Although two of the reactors were put out of commission for a year, and one was destroyed, no one received an overdose of radiation from these accidents. The results of the accidents agree in a remarkable way with experimental work which showed that only a small fraction of some of the bone-seeking isotopes escape from the melted fuel. The disturbances due to these accidents were accordingly less than envisaged previously. Later generations of reactors are much better protected by containment and instrumentation, and reactors built now are thought to be proof against the maximum credible accident. With an increase in safety of operation we may in due course expect the location of plants in more populated areas. There has also been a growth of national organizations for reactor safety and inspection, similar to those for aircraft, which inspect designs and prescribe codes of operation to help to maintain safety.

Safety of Mass X-ray Surveys.—Studies made by Allsopp and Stanford of Guy's Hospital Medical School showed that the dose of radiation received by people examined by mass x-ray units is negligible. Their investigations were made as part of a survey of the medical uses of ionizing radiations being carried out by a government committee. They concluded that any radiation hazard is much less than that of having an unsuspected tuberculous lesion. Many physicians believe that in the public's reaction to the risks of x-rays the pendulum has swung too far.

Address by Minister of Health.—The Minister of Health, addressing the annual meeting of the Executive Council's Association (England), said that in the last 10 years there has been a noticeable

swing from the drug mixtures made up by the local pharmacist to preparations made by large firms which have facilities for research, manufacture, and analytical control. In 1948 mixtures compounded by pharmacists accounted for 33.3% of the total preparations supplied and factory-made products for 29.2%. Last year the respective figures were 18 and 43.1%. It may be asked whether the decrease in the number of preparations made up by the pharmacist has led to a decline in his professional responsibilities. The minister believed that these responsibilities have not declined, although they have altered in nature. He further stated that the dramatic decline in incidences of tuberculosis and deaths from diphtheria were due mainly to the new methods of treatment. On cancer of the lung and smoking, he said: "It is an example of prevention of disease in which the individual must himself decide what he should do, in the light of the facts . . . unwelcome as they are bound to be to many people." He welcomed the developments that have taken place in the provision of home care for the aged because the highest priority which the available funds allow should be given to helping older people remain as long as they can in their homes. There has been a decrease in areas regarded as understaffed with physicians. The average number of patients per physician is now 2,250, compared with 2,500 in 1948, and the number of general practitioners taking part in the National Health Service has increased from about 17,500 to more than 20,000.

Idle Electroencephalograph.—An electroencephalograph has lain idle at St. Clement's Hospital, Ipswich, for a year, because a technician cannot be obtained at \$1,400 to \$2,100 a year. Suitable technicians cannot be obtained for this salary and the Ministry of Health will not permit an increase. Technicians can obtain far more in the electronics industry. The hospital deals with psychiatric cases and patients are being sent to another hospital 20 miles away for electroencephalograms.

Duties of Nurses.—Leading hospital consultants are alarmed at proposals that nurses should confine themselves to nursing and cease to perform certain medical procedures. They fear that the result may be a breakdown in the hospital service in some areas. A committee of the Royal College of Nursing has been studying the position and duties of the nurse from a legal point of view. Most of their views are supported by the consultants, but the latter are worried by suggestions that nurses should no longer take blood samples from patients or give intravenous injections. Already in Sheffield chief nurses have issued instructions forbidding nurses to take blood samples. The consultants say that if the restrictions are extended hospital work will be impeded. The shortage of hos-

pital physicians in many parts of the country necessitates the help of nurses with some procedures. If nurses cannot do such things as taking blood samples and applying plaster casts it will be impossible to run some hospitals. Nurses also propose to stop doing clerical and domestic chores, to make possible the implementation of the 44-hour week for nurses recently agreed on. Even in some large London teaching hospitals this has not yet been achieved. Almost everywhere nurses work overtime without extra pay, especially in mental hospitals.

Pay Rise for Doctors.—Although a pay rise of 29% was requested for physicians by the British Medical Association, the Ministry of Health decided to increase pay by only 4%. An interim adjustment of 5% was made in May, 1957. These adjustments do not prejudice any recommendations likely to be made by the Royal Commission on Doctors' Remuneration, which is not expected to report until summer. The method of distributing the 4% rise is to be discussed with the British Medical Association, which has suggested that a percentage increase should be applied to capitation fees (at present \$2.45 per patient per year), car mileage, and maternity fees. This will be to the advantage of country doctors, who treat more obstetric patients and travel longer distances to see fewer patients than doctors in towns. The Ministry of Health vetoed any increase in specialists' merit awards, which have remained the same for 10 years, in spite of rising prices and wages. The *British Medical Journal* comments on this: "It would not have cost the Treasury much to make a small acknowledgment to merit, and enterprises outside State control long ago found that they could ill afford not to foster this quality." Hospital physicians and dentists will also share in the 4% rise which will cost about 14 million dollars annually. The increases dated from Jan. 1, 1959. The extra for general practitioners will cost nearly \$5,600,000 and will raise their average annual income from \$6,550 to \$6,812. This rather belated decision to increase salaries followed repeated requests by the British Medical Association, beginning a year ago. There was then some justification for a refusal owing to the country's financial state, but now that the nation's economy has improved, an increase of 4% is regarded as a meager figure.

Treatment of Cancer by Irradiation and Oxygen.—Tissues are more sensitive to irradiation at high oxygen tensions. Dr. I. Churchill-Davidson, radiotherapist at St. Thomas' Hospital, London, stated at a press conference recently that 67 patients with inoperable cancer were treated at the hospital by irradiation in a compression chamber in which pure oxygen was breathed. The patients were anesthetized before being put in the chamber. A

five-year follow-up will be necessary to see if this method of treatment offers any advantage over conventional radiotherapy.

Retinal Coagulation.—A new apparatus for the treatment of retinal detachment, developed by Dr. M. Schwickerath of Bonn, Germany, was installed at Moorfields Eye Hospital, London. It is a light coagulator working on the principle of the burning glass. An electric arc enclosed in a quartz tube containing pressurized neon is the source of the light, which is passed through a system of lenses and then through an ophthalmoscopic mirror. The eye surgeon directs a filtered part of the beam on the lesion in the fundus. When this is accurately located the full beam is passed for a fraction of a second to produce a minute burn on the retina. Several treatments seal off the lesion. The eye is anesthetized and the patient experiences no more discomfort than he would in an examination with an ordinary ophthalmoscope. At present this technique is being used only for the treatment of retinal holes and thin areas not deeply detached, Eale's disease, retinitis proliferans, retinal hemangiomas, small malignant melanomas, and for optical iridotomy.

Fellowship for Freedom in Medicine.—Dr. R. Hale-White, the chairman of the Fellowship for Freedom in Medicine, said in an address at the annual general meeting that the National Health Service (NHS) was lowering the standards of medicine with increasing speed each year. He referred to the views of Sir Hartley Shawcross, a lawyer who was in the last Labor government who believed in the need for private practice. To a questionnaire circulated to a group of physicians asking whether they thought an alternative health service should be formed over 75% answered "yes." The government, said Dr. Hale-White, must be urged to permit private patients to obtain their drugs under the same conditions as NHS patients. Another speaker, Brigadier Skentelbury, said that as it is responsible to Parliament the NHS must be bedevilled with politics no matter what party is in power. A hospital that was completely independent would be more effectively run at less cost than one subject to the restrictions and extravagance of centralized administration. The NHS sought to apply civil service methods of centralized control, but the Civil Service was unfitted by training, aptitude, and organization to solve the problems of hospitals. If free medical care is supplied, why not free food, free drink, free travel, or free entertainment? The proper solution is relief by insurance.

Treatment of Tetanus.—Tetanus is usually treated with barbiturates and neuromuscular blocking agents, both of which depress respiration. There is a need for a drug in the treatment of this condition

that can suppress the convulsions without interfering with respiration or causing loss of consciousness. Laurence and Webster described a method for screening likely drugs by producing local tetanus in the gastrocnemius of rabbits with tetanus toxin (*Brit. J. Pharmacol.* 13:330, 334, 1958). The drug under test is injected intravenously and the time required for suppression of tetanic activity noted. Chlorpromazine, thiopental sodium, betanaphthoxyethanol, and mephensin were compared using this test. Chlorpromazine was the most active, being over 250 times as effective as mephensin and more than 50 times as effective as thiopental. Other phenothiazine derivatives screened by the authors included acetylchlorpromazine, which was found to be 10 times as potent as chlorpromazine.

Tetanus in the Operating Room.—Lowbury and Lilly showed that *Clostridium tetani* is present in the air of operating rooms in Birmingham (*Brit. M. J.* 2:1334, 1958). They collected bacterial samples from the air with a large slit sampler and made cultures in nutrient gelatin with settle plates. Sampling for 30 minutes showed the presence of *Cl. tetani* in the air of the road adjacent to the hospital and in the air of exhaust-ventilated operating rooms. None of these organisms was found in a plenum-ventilated burns dressing station. As no cases of clinical tetanus have been reported from the hospitals in the last nine years, the risk of infection appears to be remote. *Cl. tetani* was also found in all specimens of hospital floor dust, in the trouser cuffs of laboratory staff, and in 10 of 35 human fecal specimens. It was not found in any of 273 swabs from burns.

Mental Deficiency due to Carbon Monoxide.—Damages were awarded to a truck driver who became mentally deficient after inhaling fumes in an oil carrying truck. The plaintiff inspected the oil tank and climbed inside. Fumes overpowered him, and he lay unconscious in the tank as the truck was driven by a mechanic from the garage to the street. It was stated that in starting the engine in a confined space, carbon monoxide accumulated and entered the tank of the truck where it was inhaled by the plaintiff. He was eventually missed and found half an hour later unconscious in the tank. He remained unconscious for 10 days. On recovery he was found to be suffering from serious and permanent cerebral damage resulting in organic dementia bordering on stupor. A neurologist testified that although the plaintiff's physical condition was normal he did not know the date or time, could recognize coins only with difficulty, could not add small numbers, did not know the names of his brothers or sisters, and could not dress himself properly. In the neurologist's opinion the plaintiff's condition was consistent with cerebral damage due to inhaling carbon monoxide. He was permanently

demented and no form of treatment was likely to help him. The defendants denied liability and claimed that the plaintiff was not required to clean the tank. Drivers were in fact forbidden to enter a tank before it had been treated and this one had not. The jury found the employers liable. They assessed total damages at \$49,000 but held the plaintiff to be 40% at fault, so he was awarded only \$29,400.

Too Many X-rays.—In his report for 1957, the health officer for Smethwick referred to the many diagnostic x-ray examinations that are made only because they are requested by the patient. He stated that expensive, time-consuming diagnostic procedures involving repeated irradiation of vital organs are regularly undertaken to exclude such conditions as peptic ulcer and kidney and liver disease in patients who obviously need rehousing more than reexamination by x-ray or the exclusion of in-laws rather than of liver disease. The population receives more and more radiation, said Dr. Dodds, much of it to little purpose.

Neonatal Hyperbilirubinemia.—High serum bilirubin levels have a well-recognized association with kernicterus and are often found in premature babies who may also develop this condition. Forfar and co-workers reported the results of treating premature babies by exchange transfusion to remove the bilirubin from the circulation (*Lancet* 2:1131, 1958); 45 exchange transfusions were given to 37 infants in the first week of life. In 9 Rh incompatibility was the cause, but in the remaining 28, of whom 26 were premature, no cause other than hepatic immaturity was discovered to account for their jaundice. Fresh compatible blood in acid-citrate-dextrose mixture was transfused into the umbilical vein, which was found to be the most convenient vessel and could be used up to a week after birth. When this was unsuitable the saphenous vein was used. A volume of 80 to 90 ml. per pound of body weight (36 to 41 ml. per kilogram) was exchanged at a rate of 0.8 ml. per pound (0.36 ml. per kilogram) per minute. The transfusions removed much of the bilirubin not only from the blood but also from the infants' tissues, thus reducing the chance that the serum bilirubin would rise to levels at which kernicterus might occur. The mean pre-transfusion serum bilirubin level was 25.5 mg. per 100 ml., and the mean post-transfusion level was 11.2. Because of a subsequent rise seven infants were given further transfusions. The mean minimum mass of bilirubin removed was 19.7 mg. per transfusion, whereas the mean fall in circulating bilirubin was 10.8 mg., indicating that at least 45% of the bilirubin removed came from the infants' tissues. The volume and rate of transfusion were important. Too small a volume was ineffective, and

too rapid a transfusion was both ineffective and dangerous. The only common post-transfusion complication in these patients was anemia.

Staphylococcal Infection in Maternity Hospitals.—Staphylococcal cross infection among infants in a maternity hospital was studied over two and one-half years by Gillespie and co-workers (*Lancet* 2:1075, 1958). They found that many infants became carriers of *Staphylococcus pyogenes* var. *aureus* soon after birth and that they were the chief sources from which these organisms spread to other infants. The umbilicus was colonized before the nose, groin, and perineum to which the staphylococci spread from the umbilicus. The nose, more often than the umbilicus, harbored the group 1 strains which caused most sepsis. Nasal carriage was usually more persistent than umbilical carriage and was probably more important in disseminating hospital strains of staphylococci into the general population. Most infants who became staphylococcal carriers suffered little harm, unless the strains were of bacteriophage pattern 52A/79 or 80, which caused the most sepsis. These were most numerous in the nose. Group 3 strains were found mainly on the umbilicus. Sepsis developed more frequently in those infants who carried staphylococci on the nose and umbilicus by the second day of life. Contact by nurses was thought to be one mode of spread as the incidence of cross infection was reduced by the use of an antiseptic hand cream containing chlorhexidine. Dusting the umbilicus and surrounding skin of the infant with a powder containing hexachlorophene caused a marked reduction in staphylococcal infection. Disinfection of blankets had little or no effect but was not thought to be without value, because it might have helped if other sources of staphylococci had been reduced first.

An epidemic in a Glasgow maternity hospital, investigated by Dr. Timbury and co-workers, was due to bacteriophage-type 80 (*Lancet* 2:1081, 1958). This caused a number of serious infections in the babies and resulted in eight deaths. Bacteriophage-typing showed that the organism had not been in the hospital before the epidemic. Spread by the nursing and hospital staff was not thought to be an important factor as the nasal carrier rate among them and the rate of colonization of the hospital environment generally was remarkably low. The staphylococci acquired in hospital caused infections shortly after the discharge home in 21% of the babies born in the last two weeks of the epidemic period. Babies who carried or were infected with type 80 organisms were followed up at home four months after discharge from hospital. Examination of nasal swabs showed no evidence that these organisms persisted longer in the nose than those of any other strain, and the danger of their spreading widely in the general population seemed slight.

CORRESPONDENCE**TYPHUS—A REMINDER**

To the Editor:—We have recently seen another case of murine typhus at this hospital, undoubtedly a case of the endemic type, which from time to time flickers forth in the Southwest. In addition to the occasional sporadic case, small pseudoepidemics of murine typhus are not infrequent in this area. The reservoir of the *Rickettsia* responsible for this disease is the rat, and the vector is the rat flea, although the dog tick is thought to be incriminated from time to time. It is well to bear these facts in mind when any patient with a fever of undetermined origin is discovered.

I saw eight such cases in a little more than one year while in private practice in Little Rock, Ark., some 10 years ago. At the same time a case of Rocky Mountain spotted fever was seen; this case proved to be fatal. All of the patients with typhus made complete recovery. Three of these received no antibiotics. The remaining five received chlortetracycline. Of these five, three developed no specific agglutinins, and it was felt that this was due to the fact that antibiotic therapy was started early in the disease. The three patients who did not receive specific antibiotics developed specific agglutinins and had debilitating and prolonged illnesses. All of the five who received antibiotics showed rapid and complete recovery with no debilitation, although, as in the three who were untreated, most of them developed delirium at one time or another during their illness.

Since being at this hospital I have seen three cases of typhus in addition to the one to be reported. These all ran true to form. The diagnosis is not difficult to make. The history invariably reveals that the patient has rats on his property or in the place in which he works. This is particularly true of farmers who have feed rooms or feed bins. The onset is rather sudden, with very high fever and very severe headache. These symptoms are accompanied by chills and drenching sweats. On the fourth to sixth day (usually the fifth day) of the disease, there is an evanescent, macular rash, usually over the upper part of the trunk, which persists from 12 to 30 hours, the average being around 18 hours. If therapy is then begun with any of the tetracyclines, there is defervescence to 100 F (37.8 C) or less within a period of 36 to 48 hours. In one of the patients seen in Little Rock the temperature dropped from 105.2 to 97.8 F (40.7 to 36.6 C) in a three-hour period, 27 hours after the

institution of chlortetracycline therapy. The case to be reported here shows all the typical features of murine typhus.

The patient was a 65-year-old man who was admitted to this hospital on Sept. 10, 1958, complaining of generalized aching and fever. On Sept. 7 the illness had begun with chills, general malaise, fever, and drenching sweats. He had been given sterile procaine penicillin G suspension (Crysticillin) and phenoxymethyl penicillin (V-Cillin) tablets by his local physician. On the day of admission he had been nauseated and had vomited two or three times. On the same day he complained of mild chest pain and some abdominal soreness, as well as severe frontal and hatband headache. The physical examination was not remarkable except for the fact that the patient was flushed and perspiring profusely and looked acutely and severely ill. There were a few crepitant rales in both lungs. For the first five days of hospitalization his temperature ranged from 101 to 104.4 F (38.3 to 40.2 C), for the most part being over 103 F (39.4 C). On the fourth hospital day he developed an evanescent, macular rash over the chest and back, which faded in less than 24 hours. It was then found that his avocation was raising chickens, that he had feed bins, and that there were "literally hundreds of rats around the place." At this point the diagnosis was made, and therapy with a combination of tetracycline phosphate and nystatin (Mysteclin-V) was instituted. In less than 36 hours, his temperature was less than 100 F and thereafter did not go above that level. On his admission multiple agglutinations were found to be negative, and when his *Proteus vulgaris* OX-19 agglutination was repeated on Sept. 12, it was still found to be negative. However, on the 9th hospital day and again on the 14th hospital day he was found to have a positive OX-19 agglutination in a titer of 1:160. From the fifth to the eighth hospital day the patient was in and out of delirium. He made an uneventful recovery.

In any case of unexplained fever, particularly when there is a history of rats in the vicinity and the patient develops an evanescent rash on the fourth to sixth day of illness, typhus should be seriously considered and treatment instituted with one of the tetracyclines immediately.

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WOMAN PHYSICIANS

To the Editor:—In Medical News in THE JOURNAL of Dec. 20, 1958, on page 2160, a statement appears which is frequently made and is not quite correct. It is in regard to the Elizabeth Blackwell award, and it states that Elizabeth Blackwell was "reportedly the first woman doctor in the world." It is more correct to speak of Elizabeth Blackwell as the first woman doctor of modern times, and even this is not quite true because there is the case of Dr. James Barry, a medical officer in the British Army, who died in London in 1865 and was found at post mortem to have been a woman. In the Greco-Roman period there were women physicians; in the Middle Ages there was the famous woman doctor, Trotula, who served on the faculty of the Salerno Medical School during the eleventh century; and later in the eighteenth century there was Dr. Ann Monzolini, professor of anatomy at the University of Bologna. An interesting account of women physicians is found in "Women Doctors of the World" by Esther Pohl Lovejoy, published in 1957, and I recommend it to all who are interested in the history of medicine.

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F.B.I. ITEMS IN THE JOURNAL

To the Editor:—I protest against the editorial policy of THE JOURNAL which permits the F.B.I. to use it as a vehicle for catching criminals. Perhaps one could understand it, even though not condoning it, if the malefactor sought was an insane physician, who had committed homicides, or a criminal mastermind of a group of burglars looting physicians' offices for narcotics; but such is not the case. Manson, the wanted criminal, is a bankruptcy swindler.

Years ago when Dr. May was sentenced to two years in prison for harboring the notorious Dillenger, the *Lancet* published an editorial suggesting an accolade for him for being true to the spirit of the Hippocratic Oath. The late Lord Horder, a leader of British medicine and physician to the King, once publicly declared that if he were acting as a surgeon and had treated a man with a bullet wound and immediately thereafter heard broadcast his description, as a bank robber, he felt no obligation to inform the police. Perhaps this is too zealously guarding professional confidentiality, but if the present policy in this country is continued, the physician's examining room will resemble a rural post office, with its walls plastered with photographs of wanted

criminals. The physician is still an important influence in moulding public opinion. Let him not use this influence to create a police state. Physicians have a high sense of social responsibility; but this does not call for them to act as special agents for the police.

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NEONATAL INFECTIONS IN COMMUNITY HOSPITAL

To the Editor:—The following is an addendum to my article on page 559 of this issue of THE JOURNAL. After a communication from the Department of Clinical Investigation of Parke Davis & Company received on Jan. 26, a review of the relationship of chloramphenicol therapy to the cases reported in my article was undertaken; 22 of the 30 patients received on Jan. 26, a review of the relationship of the 12 who died 10 were given chloramphenicol orally, intramuscularly, or intravenously in doses ranging from 50 to 313 mg. per kilogram per day. Most of these infants were given about 150 mg. per kilogram per day. It was pointed out by the communication from Parke Davis & Company that large doses of chloramphenicol, when given to premature and newborn infants, produced the following findings, and sometimes death:

1. Abdominal distention within two or three days of institution of therapy.

2. A so-called gray syndrome consisting of progressive pallid cyanosis with abdominal distention.

3. Vasomotor collapse.

It is believed that the causal factor is related to the immature functional status of the liver and kidneys with respect to glucuronide conjugation and/or excretion.

In at least three (cases 28, 29, and 30) and possibly two (cases 19 and 24) of the deaths reported in this series, chloramphenicol could be implicated in the unfortunate outcome. The patients in cases 28, 29, and 30 died rather suddenly in vasomotor collapse. The patients in cases 29 and 30 were given chloramphenicol as a prophylactic measure only, and these deaths may well have been iatrogenic in origin. Two other infants (cases 14 and 18) receiving chloramphenicol presented rather sudden abdominal distention, cyanosis, and apparent cardiac failure, but recovered. The oldest infant of this series in which the symptoms may have been related to chloramphenicol was 3½ weeks of age.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Diagnostic Aspects of Subacute Bacterial Endocarditis in the Elderly. W. J. Gleckler. A. M. A. Arch. Int. Med. 102:761-765 (Nov.) 1958 [Chicago].

The author reports on 6 men and 4 women, between the ages of 57 and 81 years, with subacute bacterial endocarditis, seen consecutively at the Community Hospital of San Mateo County in San Mateo, Calif., during the past decade. Three of the 10 patients showed the typical clinical features of the disease, with a heart murmur, fever, leukocytosis, enlargement of the spleen, anemia, weight loss, and embolic phenomena. The remaining 7 patients presented difficult diagnostic problems. Three of these had clinical signs and symptoms of psychosis, and one each presented the aspect of gastrointestinal disease, renal insufficiency, apoplexy, and simple weight loss without fever. The high incidence of atypical cases is characteristic of subacute bacterial endocarditis in older persons. The only clinical sign or symptom constantly present in this group of patients was a heart murmur.

The chief obstacles to diagnosis in patients of advanced age are the common occurrence of a variety of pathological processes of differing causation in the same person and the difficulty in distinguishing the clinically most significant findings. The disease often seems simply to accentuate previously present pathological processes, and it is easy to assume the accentuation to be due to advancement of the originally present process rather than to a new additional disease. Helpful in making the right diagnosis is the presence of a heart murmur. Also, when it was measured, the serum protein pattern always showed reversal of the albumin-globulin ratio. No other single clinical sign or symptom was present in all these patients. It might well be said that the presence of a heart murmur should be a reminder of the possibility of subacute bacterial endocarditis in any elderly patient, even if the rest of the clinical picture would seem to

suggest the presence of a psychosis, renal insufficiency, gastrointestinal malignancy, or other unconnected illness.

The Syndrome of Ventricular Septal Defect With Aortic Insufficiency. R. C. Scott, J. McGuire, S. Kaplan and others. Am. J. Cardiol. 2:530-553 (Nov.) 1958 [New York].

The authors report on 7 patients, 4 male and 3 female, between the ages of 5 and 34 years, with the syndrome of congenital ventricular septal defect associated with aortic insufficiency. Two of the patients died, and the diagnosis was confirmed in both by autopsy. The diagnosis in 5 patients was supported by cardiac catheterization, in 1 in addition by an angiocardigram and a retrograde aortogram, and in 1 by exploratory thoracotomy. There was usually a history of exertional dyspnea and frequently of congestive heart failure. The positive physical findings consisted of an enlarged heart, a loud systolic murmur most commonly heard maximally in the left 2nd to 4th interspaces, and a high-pitched aortic diastolic murmur transmitted down the left sternal border. A continuous murmur was heard in one patient. The pulse pressure was wide in all the patients. Cardiac fluoroscopy revealed an enlarged heart with a prominent pulmonary arch segment, pulmonary overcirculation, and dynamic pulsations of the aorta. The electrocardiogram showed left ventricular hypertrophy in 3 patients, combined ventricular hypertrophy in 3, and right bundle branch block in 1. Cardiac catheterization revealed pulmonary hypertension and an increase in oxygenation at the right ventricular level.

The cases of 22 patients, between the ages of 5 and 57 years, with ventricular septal defect with aortic insufficiency were collected from the literature. In some of these the diagnosis was confirmed by autopsy, and in the others the diagnosis rested on physical, laboratory, or surgical findings. In all the cases proved by autopsy, one or more of the aortic valve cusps were either thickened and deformed or unsupported, or both. In several cases the affected valve was described as being sacculated, ballooned, or even having an aneurysmal dilatation. Nine of the patients on whom autopsies were performed had cardiac catheterization studies done.

The precise preoperative or antemortem diagnosis of this syndrome may be difficult at times. The described clinical features, while characteristic,

The place of publication of the periodicals appears in brackets preceding each abstract.

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are not pathognomonic, as are other conditions with to-and-fro or continuous murmurs at the base of the heart, and an additional wide pulse pressure may simulate the syndrome of ventricular septal defect with aortic insufficiency. Cardiac catheterization is helpful in indicating a left-to-right shunt at the level of the right ventricle. However, other conditions than a ventricular septal defect can produce increased oxygenation in the right ventricle. These include ruptured aneurysm of the sinus of Valsalva into the right ventricle and patent ductus arteriosus or aortic septal defect with pulmonic valve insufficiency. In the two latter conditions passage of the catheter from the pulmonary artery into the aorta will help distinguish these defects from the present syndrome. Because of the possibility of surgical treatment for intracardiac and extracardiac lesions associated with left-to-right shunts, the correct diagnosis of the syndrome of ventricular septal defect with aortic insufficiency becomes mandatory.

Shock in Acute Coronary Thrombosis and Treatment with L-Nor-Adrenalin. O. Lindeneg and N. I. Nissen. *Ugesk. læger* 120:1395-1402 (Oct. 16) 1958 (In Danish) [Copenhagen].

One of the gravest and earliest complications in acute coronary thrombosis is peripheral or cardiovascular collapse, called shock because of the clinical resemblance to other forms of shock. The mechanism of cardiogenic shock is not fully clear. The indications for levarterenol therapy in clinical shock which does not respond to the usual treatment have been (1) acute grave shock lasting more than 15 minutes, (2) shock setting in slowly with moderate hypotension, lasting 1 hour or more, and (3) occurrence of more than 3 transitory shock periods within 12 hours. Thirty-four patients (21 men, aged from 48 to 82 years, and 13 women, aged from 47 to 77) with acute coronary thrombosis were treated with levarterenol. In 26 cases satisfactory increase in blood pressure was achieved; in 13 patients stable normotension could be maintained after treatment was ended, and 9 patients survived the acute phase of the thrombosis and were discharged as well. In general, the prognosis was unfavorable when high dosage of levarterenol was necessary to keep the blood pressure up. The prognosis was better for younger patients, but the mortality was not higher among patients with earlier coronary thrombosis and heart insufficiency than among the others. Disturbances in conduction and arrhythmia were not more frequent during treatment with levarterenol than before it. The frequency of heart rupture was not especially high. Pulmonary edema was frequent but occurred as often before as during treatment. In some cases cortisone was administered simultaneously, but its effect could not be estimated. This material, to-

gether with the reports in the literature, indicates that levarterenol therapy, instituted early and carried out carefully, is of value, but further experience must be collected.

Hydroquinidine Combined with Reserpine in the Treatment of Atrial Fibrillation. F. Fontanini, A. Rivi and S. Signorelli. *Minerva med.* 49:3815-3822 (Oct. 10) 1958 (In Italian) [Turin, Italy].

Two groups of patients, each consisting of 20 persons who had atrial fibrillation but who had not had either marked cardiovascular insufficiency or past embolic disorders and who had not previously received treatment for restoration of heart pulsation, were placed on hydroquinidine and reserpine therapy. As an anticoagulant 100 mg. of heparin was administered intravenously to the patients every 6 hours for 3 days to prepare them for the main chemotherapy. The day before treatment with hydroquinidine and reserpine was begun, 200 mg. of hydroquinidine was given to all the patients so as to eliminate those who could not tolerate the drug. Then, one group of patients received a maximum daily dosage of 2 Gm. of hydroquinidine alone in doses of 400 mg. administered orally every 2 hours for 1 or 2 days. The other group received a maximum daily dosage of 2 Gm. of hydroquinidine combined with 2 mg. of reserpine in doses of 100 mg. of hydroquinidine, 0.10 mg. of reserpine, and 2 mg. of adenosine, administered orally every 2 hours for 1 or 2 days.

Sinus rhythm was restored in 12 patients receiving hydroquinidine alone (60%) and in 16 patients receiving the combined treatment (80%). The combination of hydroquinidine and reserpine permitted use of a smaller dose of hydroquinidine. Patients who benefited from hydroquinidine alone received, on the average, a dose of 1.30 Gm. of hydroquinidine, whereas the patients who benefited from the combined treatment received, on the average, a dose of 1.07 Gm. of hydroquinidine. Reserpine partly offset the tachycardiac effect of hydroquinidine. An increased heart frequency was observed in 3 patients, 2 of whom were refractory to the therapy. Heart frequency decreased in most of the remaining patients. Tolerance to hydroquinidine was satisfactory, although it varied among individual patients, but in no instance did it reach an intensity requiring an early withdrawal of the drug. The main advantage in using the combination of hydroquinidine and reserpine in this series of patients consisted in the counterbalancing action of reserpine on the tachycardiac effect characteristic of hydroquinidine. It also seems that the combination of hydroquinidine and reserpine exhibits a synergic action for the treatment of atrial fibrillation, although further investigation is necessary to appraise this presumption.

Gastrointestinal Haemorrhage and Salicylates. A. S. Alvarez and W. H. J. Summerskill. *Lancet* 2:920-925 (Nov. 1) 1958 [London].

The authors report a planned investigation of the relationship between salicylate consumption and gastrointestinal hemorrhage in consecutive admissions to a community hospital, with careful attention to salicylate habits, both of the subjects studied and of a control group. Of 121 patients hospitalized with hematemesis and/or melena, 18 were excluded from the study because of bleeding associated with trauma. There remained 103 patients in whom bleeding was thought to be associated with acute or chronic peptic ulceration. The onset of hemorrhage was timed from symptoms of faintness or collapse or, in their absence, from objective evidence of bleeding. Details of habitual salicylate consumption and salicylate consumption during the 72 hours before bleeding were taken immediately. These included the time the drug was taken, the number and type of tablets, the method of and reason for their consumption, and dyspeptic symptoms of intolerance, if any. Salicylate habits and consumption within the preceding 72 hours in a control group complaining of dyspepsia, but not of gastrointestinal bleeding, were assessed in 103 consecutive new outpatients attending the gastroenterologic clinic.

Barium-swallow-and-meal examinations were carried out in all patients in both groups, except 10 who had operations or died as a result of hemorrhage. The effect of doses of salicylate and non-salicylate analgesics on dyspeptic symptoms and stool occult blood content was investigated in 35 subjects, 14 of whom had had peptic ulcers. The local action of salicylates on the stomach was studied at partial gastrectomy for peptic ulcer. Four patients received aspirin for 5 days before the operation and with the premedication; 8 patients, for control purposes, received no salicylate.

Salicylates could be incriminated in more than 40% of the 103 patients admitted to hospital with hematemesis and/or melena associated with peptic ulcer. The lesion induced by salicylate was difficult to define at gastroscopy or at partial gastrectomy. The clinical history, together with findings at emergency partial gastrectomy, indicated that acute erosions in the stomach, and possibly lower in the gastrointestinal tract, were sometimes responsible, although activation of a preexisting chronic peptic ulcer often seemed likely. No alteration of prothrombin time due to salicylates was found in patients with gastrointestinal bleeding. Occult blood loss in the stools occurred during periods of salicylate consumption in approximately 50% of patients with peptic ulcer or x-ray-negative dyspepsia and of controls. Patients with previous dyspepsia were more liable to massive hemorrhage, but occult bleeding occurred equally

in all groups. Both soluble and insoluble aspirin caused occult bleeding, but non-salicylate analgesics did not influence the stool occult blood content. There was no evidence that soluble aspirin reduced the risk of major bleeding; neither were dyspeptic symptoms of intolerance nor the method of taking salicylate preparations related to the occurrence of hematemesis and melena.

Clinical Use of a Single Daily Dose of Para-Aminosalicylic Acid in Association with Isoniazid. E. V. Bridge and D. T. Carr. *Am. Rev. Tuberc.* 78:749-752 (Nov.) 1958 [New York].

The authors studied the efficacy of a single daily dose of para-aminosalicylic acid (PAS) given with isoniazid to 70 patients with tuberculosis admitted to Mineral Springs Sanatorium, Cannon Falls, Minn. The bacteriological studies necessary for analysis of therapeutic results were completed in 47 patients. Twenty-three of the 70 patients were excluded for various reasons, such as exclusively extrapulmonary location of the disease, resistance of the tubercle bacilli to PAS or isoniazid before treatment, or premature departure from the hospital. Twenty-three of the 47 patients were men, whose average age was 56 years, and 24 were women, whose average age was 41. Forty patients had had no previous antituberculous chemotherapy, and 7 had had such treatment previously. Tubercle bacilli were recovered from all 47 patients. The disease was minimal in 11 patients, moderately advanced in 22, and far advanced in the remaining 14. Para-aminosalicylic acid was given as tablets of the sodium or calcium salt, the dosage being 7 Gm. (or 5 Gm. of PAS) each morning after breakfast. The conventional dosage of isoniazid, 150 mg. twice a day, was given also. Specimens of sputum or gastric washings were cultured for acid-fast bacilli before treatment and at monthly intervals during treatment.

Three of the 47 patients were unable to take the recommended dose of PAS. A few patients had some gastrointestinal irritation but were able to continue treatment with the same or another salt of para-aminosalicylic acid. Three patients switched to a proprietary preparation of para-aminosalicylic acid, Rezipas, with satisfactory results. Although tubercle bacilli had been recovered from all patients before treatment, after 2 months of treatment tubercle bacilli were recovered from only 9 (19%). After 4 months of treatment only 5 (11%) had cultures positive for tubercle bacilli, a conversion rate of 89%. After 120 days of treatment tubercle bacilli susceptible to both PAS and isoniazid were recovered from 2 patients. Treatment was continued, and cultures from these 2 patients were negative for tubercle bacilli at the end of the study. Drug-resistant bacilli were recovered from 3 patients. Results showed that a single daily dosage of 5 Gm. of PAS (7 Gm. of the sodium or calcium salts)

given in association with 150 mg. of isoniazid twice daily was better tolerated and was equally as effective as the conventional dosage of 3 Gm. of PAS given 3 or 4 times a day. The advantages of less gastrointestinal irritation and economy suggest that this regimen should be studied more extensively.

Sarcoidosis: Clinical Observation on 160 Cases. H. L. Israel and M. Sones. *A. M. A. Arch. Int. Med.* 102:766-776 (Nov.) 1958 [Chicago].

The authors report on 55 male and 105 female patients with sarcoidosis, seen in clinic, hospital, or office practice in Philadelphia between 1938 and 1956. Of the 160 patients, 138 were Negroes and 22 were whites. Eighty-eight (more than 50%) were between the ages of 21 and 30 years, and 35 were between 31 and 40; only 25 were less than 21, and 12 were over 40. Predominance of Negroes and the high prevalence of the disease in females are noteworthy facts that must be taken into consideration in attempts to ascertain the causation of the disease by epidemiologic study. All the patients had one or more biopsies revealing epithelioid tubercles. There was a wide range of clinical manifestations, with peripheral adenopathy observed in 110 patients, cutaneous sarcoids in 45, erythema nodosum in 3, enlargement of liver and spleen in 54, ocular lesions including enlargement of lacrimal glands in 28, and parotid enlargement in 10. White blood cell counts below 5,000 per cubic millimeter occurred in 59 patients (37.5%). Eosinophilia was observed in 21.8%. Hyperglobulinemia with values greater than 3.5 Gm. per 100 cc. occurred in 103 patients (45.6%). Seventy-two per cent of the patients failed to react to conventional second-strength doses of tuberculin (0.005 mg. of purified protein derivative), 22% reacted to second-strength tuberculin, and 6% manifested a reaction to first-strength tuberculin. Tuberculosis proved to be a complication in 6 of the 160 patients. Roentgenographic evidence of pulmonary or tracheobronchial lymph node involvement was observed in 151 patients (95%). Thirteen patients died; 2 deaths were due to tuberculosis and 11 to progressive sarcoidosis, with respiratory insufficiency due to progressive pulmonary damage being the commonest cause of death.

Corticosteroid therapy is indicated in many patients with sarcoidosis and can safely be given to those whose diagnosis is supported by careful clinical and laboratory study. Marked improvement resulted in 61% of the patients with symptoms of less than 6 months' duration, while a similar degree of improvement occurred in only 29% of the patients with symptoms of longer duration. Marked clearing later occurred spontaneously in a few patients whose diffuse pulmonary lesions showed no response to cortisone. It should

not be assumed that sarcoid lesions unaffected by cortisone are irreversible. Cortisone and its derivatives appear to be as effective as corticotropin and are more conveniently administered. An initial daily dose for the adult of average weight is 40 mg. of prednisone or prednisolone for 10 days. The dose should be reduced gradually to the lowest level which maintains the desired effect. The total duration of treatment, as a rule, is 1. or 2 months.

SURGERY

Surgical Considerations in Cerebral Arterial Insufficiency. W. S. Fields, E. S. Crawford and M. E. DeBaakey. *Neurology* 8:801-808 (Nov.) 1958 [Minneapolis].

More extensive use of angiograms in patients with suspected cerebral arterial insufficiency has revealed that a lesion contributing to the syndrome may be located extracranially in approximately 25% of patients. This report concerns 71 patients in whom extracranial, occlusive disease of the carotid, vertebral, or innominate vessels was suspected. Extracranial lesions were demonstrated by angiographic examination in 47 patients, and 32 patients with 42 lesions were subjected to operation. The lesions found at operation were located in the innominate artery in 5 instances, the left common carotid artery in 4, the subclavian artery in 4, the vertebral artery in 2, and the internal carotid artery in 27, they were bilateral in 10 of the 32 patients. The lesions were partially occluding in 16 internal carotid, 1 innominate, 4 left common carotid, 2 vertebral, and 3 subclavian arteries and were completely occluding in 11 internal carotid, 4 innominate, and 1 subclavian arteries.

Treatment was directed toward restoration of a normal pulsatile blood flow to the brain distal to the occlusion. To achieve this objective, 2 types of procedures—thromboendarterectomy and end-to-side bypass graft—were employed. Thromboendarterectomy was accomplished by opening the involved artery and removing a localized segment of intima containing the obstructing atheromatous mass. The bypass-graft technique consisted of the insertion of a graft, with one end sutured to the uninvolved artery proximal to the lesion and the other end sutured to the uninvolved artery distal to the lesion. For successful application of these techniques, the lesion had to be located extracranially and discretely localized, with a reasonably normal patent segment of artery both proximal and distal to the obstruction. Patients were selected for operation on the basis of arteriographic findings.

The results of operation varied with both the location and the extent of the lesion. For example, a reasonably normal distal circulation was restored

in 15 of the 16 patients with partial occlusions of the internal carotid artery. Due to the extensive nature of the lesion and lack of a distal patent segment, circulation was restored in only one patient with complete occlusion of the internal carotid artery, which had prevailed for less than 3 days. Occlusion in the other patients had been complete for 2 weeks to several months. Circulation was restored in one patient with partial occlusion of the vertebral artery but not in another patient with more extensive occlusion of the vertebral artery. Restoration of circulation was successful in all patients with occlusion of the great vessels originating on the aortic arch. Preoperative symptoms of 14 patients consisted of intermittent hemiplegia frequently accompanied by aphasia and headache. These symptoms were relieved completely. Persistent symptoms were relieved in a number of patients, including aphasia in 2, partial blindness in 3, paresis of an extremity in 3, ear noise in 3, and mental obtundity in 3. Follow-up studies during the past 5 years have indicated that occlusion recurred in only the first patient treated by thromboendarterectomy. Failure was considered due to certain techniques that are no longer employed.

Cardiomyotomy (Heller's Operation) for Oesophageal Achalasia. W. F. P. Gammie, D. Jennings and J. E. Richardson. *Lancet* 2:917-920 (Nov. 1) 1958 [London].

At the International Congress of Gastroenterology in 1956 Heller's operation was criticized to the effect that the circular muscle at the lower end of the esophagus is the functional sphincter preventing reflux of gastric contents and that Heller's operation may completely destroy this sphincter or it may fail to do so. If the circular muscle is not destroyed, dilatation with retention will persist; if it is destroyed, reflux of acid will lead to peptic esophagitis, and the operation will be no safer than cardioplasty. Since the authors had gained the impression that Heller's operation generally produced excellent results, they reexamined their patients to see whether the results were really as good as they thought. They review observations on a consecutive series of 18 patients with achalasia, observed for 2 to 9 years and followed up after cardiomyotomy for 2 to 8 years. There is doubt whether achalasia is a single disease. The most generally accepted explanation is a toxic, infective, senile, or nutritional degeneration of Auerbach's plexus in the body of the esophagus; possibly some cases are congenital and analogous to megacolon (Hirschsprung's disease).

The authors say that in most patients the lower part of the esophagus was approached by a trans-thoracic incision, and in a few by an abdominal incision. While the length of the surgical incision into the muscular layer varied, it was always ex-

tended down to the stomach and up to a point thought to be well above the narrow segment. There were no surgical deaths among these patients, but 2 of the 18 had unfortunate sequels. The results obtained suggest that they were largely determined by the stage in the disease at which the operation was performed.

The authors differentiate 3 stages. In the first stage, there is a discrepancy between the patient's story and what is seen on the x-ray screen. Sometimes esophageal contractions are completely irregular, but there is no clinical history of dysphagia, and the barium meal is requested for an unrelated complaint such as diarrhea or ulcer. More often the reverse happens; there is a story of repeated episodes of difficulty in swallowing, but the x-ray changes are slight. In the second stage, difficulty and discomfort recur at every mealtime; the esophagus begins to enlarge, and there is some delay in the barium swallow. Characteristically, the first mouthfuls of barium pass into the stomach; and then the esophageal muscle begins to "tire" and stretch, and the barium is retained. At first these changes are reversible. In the third stage, the esophagus is dilated and elongated; there is considerable retention of food, and, if any contractions occur, they are only shallow ripples. If this stage is allowed to persist, the changes become irreversible. If the esophagus is enlarged and food is retained, cardiomyotomy gives better results than hydrostatic dilatation of the cardia. Postoperative roentgenographic studies suggest that results are better if operation is done early, but there is some evidence that operation can be done too early. The authors feel that cardiomyotomy by itself does not lead to incompetence of the cardia or to gastro-esophageal reflux. Bad clinical results are seen after making too short an incision or after operating on patients with "diffuse spasm," that is, after operating too soon.

Pernasal Transsphenoidal Yttrium Implant of the Hypophysis. W. M. S. Ironside and R. D. Moseley Jr. *Postgrad. Med.* 24:497-504 (Nov.) 1958 [Minneapolis].

Since it was demonstrated that beneficial results could be obtained with hypophysectomy in certain cases of advanced cancer of the breast and the prostate, numerous routes to the pituitary have been used and methods of excision or destruction have been employed. An increasing number of patients are being subjected to procedures in which the pituitary is necrotized by implanting radioisotopes. The authors reviewed various routes to the pituitary and methods of destruction. They felt that complete destruction was more likely to follow the implant of multiple discrete sources of the radioisotope of yttrium (Y^{90}), 1 by 2 mm., rather than the 2 larger sources, 2 by 6 mm., and that the nasal

route held many advantages, the most important of which was the lower mortality rate. Furthermore, adequate local anesthesia was considered sufficient to perform the nasal operation, a considerable advantage when dealing with these rather debilitated patients. The small Y^{90} beads, which have an activity of about 1 mc., are implanted under fluoroscopic control. Generally 8 beads are implanted, but as many as 11 and as few as 6 have been used. Variations in the size of the sella and the accuracy of deposition of individual beads determine the total number deposited.

Although some 40 of these operations have now been carried out since June, 1957, only the first 26 are reviewed, for at least 2 months are required to determine the effects of the procedure. The patients were all considered unlikely to benefit from further conventional surgery, roentgenotherapy, or endocrine therapy. Moreover, the early operations were done on patients who were in a very advanced, or even terminal, stage of metastatic disease. All patients required a maintenance dose of cortisone, which averaged 50 mg. daily. Pitressin Tannate was administered to those patients in whom diabetes insipidus developed. Thyroid replacement therapy was not started until signs of hypothyroidism developed, and this does not occur for at least 2 months postoperatively. Twenty-one of the 26 patients had a primary lesion of the breast; 4, of the prostate; and 1, of the ovary. Eleven patients with breast cancer appeared to benefit. The estimation of the result was based on clinical observations, such as cessation of vomiting, increase in appetite, weight gain, changes in size of cutaneous or subcutaneous lesions, and x-ray studies of metastatic lesions. Relief of pain was the most dramatic feature in those gaining benefit from the procedure. Only 4 patients have shown a true regression, with sclerosis of osteolytic lesions, etc. All 4 patients with carcinoma of the prostate showed improvement after Y^{90} implant. Improvement was evidenced by return of appetite, disappearance of bone pain, resumption of ambulation, or return of normal urinary function. The patient who had metastatic carcinoma of the ovary did not benefit.

Intrathoracic Pheochromocytoma: Including a Case of Multiple Paragangliomas of the Functional and Nonfunctional Type. H. C. Maier and G. H. Humphreys II. *J. Thoracic Surg.* 36:625-641 (Nov.) 1958 [St. Louis].

The authors report on 2 men, aged 25 and 48 years, and a 13-year-old boy with intrathoracic pheochromocytoma, who were operated on and in whom a paravertebral tumor was first seen roentgenographically at a time when hypertension was not manifest. The younger adult patient was known to have had the tumor 3 years before hypertension was observed. This finding suggests that a patient

with a thoracic pheochromocytoma may change from an asymptomatic status to a symptomatic hypertensive state without obvious enlargement of the tumor. In this patient excision of the pheochromocytoma was followed by a gradual return of the blood pressure to normal within the course of 2½ years, while usually a rather rapid decrease may occur. The older man had no definite hypertension when a rounded mass, with smooth, well defined outer border located at the level of the right hilus, was shown on a routine roentgenogram of the chest. Removal of the tumor was not followed by significant blood pressure changes. Pathological examination of the operative specimen revealed a pheochromocytoma proved by chemical analysis. The case of this patient illustrates that a functioning pheochromocytoma can be present in the absence of hypertension. It is not justified to conclude that the absence of hypertension rules out pressor activity.

The case of the 13-year-old boy was unusual, since he had 3 (and possibly 4)-independent tumors of the paraganglionic type. The first tumor was a functional chromaffin paraganglioma or pheochromocytoma associated with the right kidney, which was removed when the patient was 11 years old. The second tumor was an asymptomatic intrathoracic tumor of the same type, originating in the 5th thoracic sympathetic ganglion, which was removed 2 years after the previous excision of the hypertension-producing perirenal pheochromocytoma. The third tumor was a nonchromaffin paraganglioma of the right carotid body, which was removed 5 years after the excision of the intrathoracic pheochromocytoma. Still 4 years later an intraspinal tumor occurred at the level of the 5th thoracic vertebra, which was also a paraganglioma, presumably chromaffin. Although extension into the foramen was looked for and not seen at the time of removal of the thoracic tumor, it is quite possible that the intraspinal tumor was a "dumb-bell" extension of the thoracic tumor. Excision of a small segment of this highly vascular tumor resulted in copious loss of blood, and no further attempt at wide excision was made.

Paroxysmal or sustained hypertension in a patient with a tumor in the costovertebral region of the thorax should lead to the consideration of an intrathoracic pheochromocytoma. When operative manipulation of a soft vascular costovertebral tumor produces considerable fluctuation in blood pressure, even though no preoperative hypertension was recorded, the surgeon must consider the possibility of a pheochromocytoma and take precautions to avoid hypertensive and hypotensive crises by appropriate drug therapy during surgical intervention. Since pheochromocytoma may be multiple, an intrathoracic location must be considered as a possibility. Adequate roentgenographic examina-

tion of the chest, combined with urinary catechol excretion determinations, are the principal diagnostic aids. Surgical excision can effect a cure if instituted sufficiently early and with proper safeguards based on recognition of the nature and behavior of the tumor.

Abscess in the Wall of the Stomach Following Empyema of the Gallbladder. J. Boer. *Nederl. tijdschr. geneesk.* 102:1805-1807 (Sept. 13) 1958 (In Dutch) [Amsterdam].

The author reports observations on a 55-year-old woman who for 3 years had been troubled with attacks of pain in the upper part of the abdomen, accompanied by vomiting, but without jaundice or fever. Complaints were somewhat less when the patient was on a low-fat diet. At operation it was found that an empyema of the gallbladder had spread, and an abscess had formed in the prepyloric region of the wall of the stomach. The abscess extended around the stomach, leaving free only the side of the small curvature. After severing the adhesions between colon and gallbladder, stomach and gallbladder were separated, and, in doing this, pus escaped from the stomach abscess as well as from the gallbladder. When the gallbladder was removed from the liver bed, it ruptured and was found to contain a stone. A stone also blocked the cystic duct. In the direction of the hepatoduodenal ligament the infectious process was less severe. The patient recovered after gastric resection with cholecystectomy. Microscopic examination showed submucous spreading of the abscess in the gastric wall. From the pathological viewpoint the lesion may be regarded either as an incomplete fistula between gallbladder and gastric lumen or as an abscess of the stomach wall.

Five Year Observations on Unsupported Fresh Venous Grafts of the Aorta in Dogs. J. E. Jesseph, T. W. Jones, L. R. Sauvage and others. *Surg. Gynec. & Obst.* 107:623-630 (Nov.) 1958 [Chicago].

The authors describe the physical and functional characteristics of 4 autogenous vein grafts implanted in the aortas of dogs for more than 5 years. The implantations had been made in the course of a more extensive investigation of several aspects of vascular replacement. One facet dealt with the differences between fresh homologous and fresh autogenous venous grafts. From each of these groups representative dogs were set aside for long-term observation. Included were autogenous external jugular vein graft to abdominal aorta (1 dog), inferior vena cava autograft to abdominal aorta (2 dogs), and inferior vena cava homograft to abdominal aorta (1 dog). The initial surgical grafting procedures were all carried out under aseptic operating-room conditions. Donor venous

segments, whether autogenous or homologous, were also obtained under sterile conditions at the time of operation. All anastomoses were made with a continuous over-and-over suture, using no. 4-0 or 5-0 atraumatic vascular silk sutures. After full recovery from operation the dogs were maintained at a farm where unrestricted activity was allowed and where as healthful an over-all existence as possible obtained. The dogs were recalled at intervals for a general checkup. All grafts were evaluated for dilatation by periodic aortography at intervals of several months to a year. For this procedure the dogs were lightly anesthetized with Nembutal, and contrast medium (Diodrast or Urokon) was injected through a catheter passed into the aorta through either a brachial or femoral artery. Only one of the animals was killed sooner than 5 years after grafting.

The functional result in all the grafts was excellent, with no instance of occlusion or rupture. Dilatation of varying degree occurred in 3 out of 4 of the grafts; in each instance it was early in the 5-year period of observation and was not progressive. The gross and microscopic appearance of the extirpated grafts confirmed the impression of excellent result, with good preservation of structure of the grafts, pliability, and lack of circumvascular reaction. Certain desirable features of the use of autogenous vein grafts in aortic arterial restoration are discussed with reference to the chemical modification and potential extension of the uses of such grafts.

NEUROLOGY & PSYCHIATRY

Encephalitis Presumably of Viral Origin, Associated with Massive Necrosis of the Temporal Lobe. C. L. Aszkanazy, M. I. Tom and L. R. Zeldowicz. *J. Neuropath. & Exper. Neurol.* 17:565-570 (Oct.) 1958 [New York].

Necroses of the brain and spinal cord are frequently present in certain forms of encephalomyelitis, e. g., the type "B" epidemic encephalitides, poliomyelitis, and herpes simplex. These foci are usually small, often even microscopic. Extensive areas of softening have only rarely been reported. During the last few years the authors observed several patients with encephalitis in whom the significant gross lesions at postmortem examination were massive areas of softening of one or both temporal lobes. In 6 of the patients the illness ran a rapid course, death ensuing within 2 weeks; the illness in the 7th patient lasted several months. The lesions in the brains of the first 6 patients were nearly identical. The brains were congested and edematous, ranging in weight from 1,250 to 1,850 Gm. The leptomeninges were congested but otherwise normal. The cerebral vessels had normal walls, except for slight arteriosclerosis in the older

patients, and contained only fluid blood. The temporal lobe in each brain was the seat of a large recent infarct. Its undersurface was soft, often even mushy, severely swollen, and hemorrhagic. This softening extended backward from the temporal pole for approximately 5 cm., inward to the hippocampus, and in 4 cases spread upward to the insula and in 2 to the adjacent portion of the posterior frontal lobe. In the 7th patient the brain weighed only 980 Gm. The inner borders of both temporal lobes, both insulae, and the tip of the left temporal pole were shrunken and softened, and the latter contained an area of cystic degeneration.

On microscopic examination the brains all showed a widespread meningo-encephalitis of the viral type. Virus studies were made in only one of the cases. The tests suggested the presence of a human agent but excluded the majority of common neurotropic viruses, leaving only the mumps virus and the adenoidal-pharyngeal-conjunctival (APC) group. The studies were felt to be inconclusive. These cases of encephalitis displayed no remarkable clinical or epidemiologic features. They occurred sporadically in widely separated geographical areas without any specific seasonal incidence. The fact that 2 of the patients were pregnant women is probably coincidental but is perhaps due to the greater susceptibility of such persons to infection. The authors feel that extensive softenings occur more commonly in viral encephalitis than is apparent from the literature. The invariable involvement of the temporal region seems too constant to be fortuitous. This could be accounted for by assuming a special affinity of the causative agent for the temporal lobe, just as the virus of encephalitis lethargica has a predilection for the substantia nigra and that of rabies for the hippocampus, but in default of any viral isolations a distinct type of encephalitis cannot be postulated solely on the basis of the anatomic distribution of the lesions. It is assumed that this necrosis results from direct action of the virus, and its localization may indicate the route by which the central nervous system becomes infected.

Dexedrine (Dextro-Amphetamine) in Treatment of Epilepsy. P. Hertoft. *Ugesk. læger* 120:1363-1367 (Oct. 9) 1958 (In Danish) [Copenhagen].

From 1955 through 1957 treatment with dextro amphetamine (Dexedrine) was given to 160 patients with epilepsy—79 with idiopathic epilepsy manifested by absence of and slight dysarrhythmia, 46 with excessive sedation, 18 with behavior disturbances, and 17 with obesity. In the first group the treatment was effective in 33 patients, 28 of whom were less than 10 years old; all were treated in addition with other antiepileptic preparations. In group 2 an effect was seen in 24 patients; in group 3 the effect was definite in 2 patients and less cer-

tain in 5; and in group 4 an effect was obtained in 10 patients. The Dexedrine dosage was 5 to 15 mg. daily. Side-effects were minor, and the treatment had to be discontinued in only one instance. Abuse of the drug was not observed. Dexedrine occupies a necessary place in the treatment of epilepsy, both in combatting the epileptic attacks and in remedying the dulling effect of some of the usual anti-epileptics.

The Consequences of Longitudinal Division of the Lumbar Spinal Cord in Puppies. S. N. Ivanova. *Bull. Exper. Biol. & Med.* (Translation from the Russian) 45:430-432 (April) 1958 [New York].

The author performed experiments on 20 puppies, in which the spinal cords were divided longitudinally from the dorsal side at the level of the lumbar and sacral segments. The ages of the animals varied from 1½ to 2½ months. Considerable disturbances in the hind legs were noted immediately after the surgical intervention. The animals could not stand or walk. The functions of standing and walking were not reestablished in puppies operated on at the age of 2 and 2½ months. When the puppies were operated on at the age of 1½ months, recovery occurred within 30 to 40 days after the surgical intervention. These findings suggest that, in contrast to previously reported observations on adult dogs, 1½-month-old puppies can compensate for total longitudinal transection of the spinal cord at the lumbosacral level, attaining complete restoration of the disturbed standing and locomotor functions of the posterior extremities.

GYNECOLOGY & OBSTETRICS

The Use of Hypothermic-Hypotensive Technique in Fulminant Toxemia of Pregnancy. R. H. Barter, S. N. Albert and A. W. Winshel. *Am. J. Obst. & Gynec.* 76:1062-1070 (Nov.) 1958 [St. Louis].

While the antitensive drugs and the newer diuretics have improved the therapeutic armamentarium of the obstetrician in the treatment of acute toxemia, medical therapy is still of limited value, compared with the termination of pregnancy. Procrastination in emptying the uterus increases the complications, although the patient with acute toxemia of pregnancy is an extremely poor surgical and anesthetic risk. The hypothermic-hypotensive technique described in this paper was introduced to give added protection to both the patient and the fetus. The first obstetric patient at the District of Columbia General Hospital in Washington, on whom this technique was used, was one who had a puerperal gas bacillus infection. She survived the infection and the operation primarily because of the use of hypothermia, and it was de-

cided to use the hypothermic method in selected patients with acute toxemia. Ten patients thus treated comprise the basis for this report.

The ages of the patients ranged from 13 to 24 years; 7 were primigravidas. Five had eclampsia and 5 had preeclampsia of a severe degree. Three of the latter also had hypertensive vascular disease. There was one multiple pregnancy. The duration of pregnancy varied between 26 and 40 weeks. Eight of the patients were delivered by cesarean section, and 2 vaginally. The average duration of the hypothermic process (including cooling and warming phases) was 9 hours. The hypothermic level ranged between 30.5 C (86.9 F) and 33 C (91.4 F) at the time that the operative procedures were done. The patient was moved to an isolated room equipped with oxygen, a suction machine, a tracheotomy set, an electrocardiograph, and all necessary emergency medications. All 10 patients tolerated the hypothermia and the hypotension without untoward effects, and all recovered. There were no arrhythmias or any ventricular fibrillation. All the infants weighing more than 1,500 Gm. (3½ lb.) survived. The only death involved a fetus whose birth weight was less than 500 Gm. Only one patient had a convulsion after the return to normothermic temperature: the condition was readily controlled by sedation with intravenously administered Nembutal and by an increased dose of the antitensive drugs. A much smaller anesthetic dose was used, in addition to the hypothermia, than would normally have been required for operative delivery. The authors feel that the results obtained with this technique justify its use in the treatment of acute toxemia.

A Thirteen-Day Human Ovum Studied Histochemically. A. T. Hertig, E. C. Adams, D. G. McKay and others. *Am. J. Obst. & Gynec.* 76:1025-1043 (Nov.) 1958 [St. Louis].

The authors describe histochemical observations on a normal human fertilized ovum recovered at hysterectomy during its 14th day of development. This specimen lay within horizon 6 of Streeter, possessing primitive unbranched villi and a definitive yolk sac. In order to orient this specimen in the whole spectrum of human development, the authors point out that horizon 5 is characterized as an ovum implanted but still avillous; horizon 6, as primitive villi, distinct yolk sac; and horizon 7, as branching villi, axis of germ disk defined. A small block of endometrium containing the ovum was fixed in ice-cold acetone and dehydrated at -20 C for 48 hours. It was then brought to room temperature and cleared overnight in oil of cedarwood. After a 1-hour bath in xylol, it was infiltrated in 52 to 54 C tissue mat for 3 hours. The paraffin block was stored in the freezer (-20 C) until cut.

The entire block was cut serially at 7 μ , and the sections were mounted according to the method used for the study of small (up to 13 mm.) human embryos. Dry ribbons of 20 sections each were arranged in parallel rows on black tissue paper. The first section in each row (section 1, 21, 41, 61, 81, etc.) was mounted in series on a 3-by-2-in. slide for the first reaction (alkaline phosphatase). The second section of each row (section 2, 22, 42, 62, 82, etc.) was then mounted on the second slide. When all the sections had been thus mounted, each slide contained seriated sections in intervals of every 20th section. From study of the dimensions of other ova in this stage of development, it had been calculated that this interval of seriated sections would ensure that each of the 20 slides would contain at least one section passing through the germ disk area. The sections were mounted on clean albuminized slides and were spread on a thin film of distilled water with the exception of the sections for glycogen, glycoprotein, and ribonucleic acid (RNA), which were spread on a film of absolute ethyl alcohol. The slides were then drained, dried overnight at 37 C, and stored at -20 C until reacted or stained.

On the basis of their observations the authors conclude that the bilaminar germ disk is rich in alkaline phosphatase and glycogen with moderate amounts of RNA and small amounts of glycoprotein. The latter is most prominent as a basement membrane between ectoderm and endoderm. The primitive amnion and yolk sac, derived from the cytotrophoblast, contain moderate amounts of glycogen, as does the chorionic mesoblast, also derived from the cytotrophoblast. The cytotrophoblast is rich in endogenous glycogen and is presumably a source of placental glucose known to be formed early in pregnancy. The syncytiotrophoblast is rich in alkaline phosphatase, especially in the brush border, and rich in adenosine-5-phosphatase, most prominent within the cytoplasm. Ribonucleoprotein is present in this layer except at the brush border. The syncytiotrophoblast contains prominent aggregates of glycogen and cellular remnants undergoing digestion, derived from ingested endometrial glandular and stromal cells.

Adenomyosis: A Reappraisal of Symptomatology. R. C. Benson and V. D. Sneed. *Am. J. Obst. & Gynec.* 76:1044-1061 (Nov.) 1958 [St. Louis].

The manifestations of adenomyosis have been stated to be progressively severe menstrual bleeding, increasingly painful dysmenorrhea, and a gradually enlarging uterus, but it appears that the symptomatology has been largely based upon clinical assumptions and generalizations. The purpose of this investigation was (1) to ascertain the rate of occurrence, extent, and accuracy of diagnosis of adenomyosis in a private general hospital, (2) to

demonstrate how adenomyosis and concomitant significant abnormalities affect the patient, and (3) to show adenomyosis as a clinical problem exclusive of coexisting disorders capable of producing similar symptoms. It is hoped that such a reappraisal will aid in earlier and more accurate diagnosis, as well as better treatment of abnormal uterine bleeding and pelvic pain. Only cases with endometrium extending into the myometrium more than 2 standard low-power fields and associated with muscle changes were accepted as examples of adenomyosis. Included in this study were all instances of this entity treated at Emanuel Hospital, Portland, Ore., from 1950 to 1957 in women, 50 years of age or under, still having menses. During the 7-year period 2,536 total and subtotal abdominal hysterectomies and 740 total vaginal hysterectomies were performed on women in the age group from 18 through 50 years. Adenomyosis was found in 701 of the 3,276 uteri, an incidence of 21.4%.

Adenomyosis can occur in any portion of the uterus as a circumscribed lesion (adenomyoma) or, more commonly, as a diffuse process in several portions of the organ. [The authors consider these 2 types together.] It is a proliferative process, now and then obscured when fibromyomas are present. The uterus is enlarged and irregularly firm. Incision into an involved area may disclose thickening of the wall. Findings include coarsely trabeculated areas, stippled or granular in appearance, with yellowish or darker cystic points which may contain serous fluid or old blood. The cut surface appears bulging. An irregularity of the endometrial-myometrial juncture is often apparent, with dipping-down of the lining epithelium into the muscle. Microscopic study confirms the endometrial extension into the myometrium. The latter invariably is of a "hypertrophy-hyperplasia" type. This feature substantiates the diagnosis of adenomyosis.

Three groups of patients were compared by the authors: (a) those found to have symptomatic adenomyosis only; (b) those with abnormal uterine bleeding and pelvic pain with adenomyosis—together with other conditions also capable of causing these difficulties; and (c) those with asymptomatic adenomyosis whose uterine disease was discovered incidentally at operation. Menorrhagia was the most common sign, and dysmenorrhea was the most usual symptom of adenomyosis. Symptomatic adenomyosis was most often found in the moderately enlarged uterus. As the size increased, other associated pathological conditions (myomas, etc.) became notable. Adenomyosis was rarely found to be the sole cause of marked enlargement of the uterus. The stage of adenomyosis tended to increase with age. Parity was related to the extent of adenomyosis, to a degree, as was the duration of the symptoms of pain and/or bleeding. Myomas were frequently associated with adenomyosis, but hyper-

plasia of the endometrium and pelvic endometriosis were not commonly noted. The symptomatology should have led to a preoperative diagnosis of adenomyosis in many instances, but it was diagnosed in less than 10% of the cases before operation. The surgical pathologist made the diagnosis in 66.7% of the gross specimens. The observations described confirmed the traditional symptomatology of adenomyosis, which is a serious, progressively disabling disorder of the premenopausal woman.

PEDIATRICS

The Conservative Treatment of Primary Tuberculosis in Children: A Five-Year Follow-up. C. S. Breathnach. *Brit. J. Tuberc.* 52:330-337 (Oct.) 1958 [London].

The author reports on 120 boys and 161 girls, less than 15 years old, with primary tuberculosis, who were followed up for 5 years. All the 281 patients were tuberculin sensitive when the diagnosis was made. The lungs were the seat of infection in 259 patients. Extrapulmonary primary lymphadenitis was found in 10 patients. The site of the infection was not detected in 12 patients. Erythema nodosum appeared in 19 girls and 6 boys; it was not seen in any child aged less than 2 years and occurred more frequently with increasing age. Treatment was conservative in most of the patients; 126 were treated by rest at home for 4 to 12 months; 101 were treated at a sanatorium for 6 months or longer, and 11 of these received chemotherapy. Right upper lobectomy was performed on 1 child, and excision of lymph nodes was carried out in 4 children with peripheral lymphadenitis. Pulmonary complications occurred in 102 patients and extensive enlargement of lymph nodes in 52, 43 of whom were aged less than 6 years. Segmental lesions were observed in 46 children, 34 of whom were aged less than 6 years. Pleural effusion occurred in 15 children. Progression to tertiary tuberculosis was detected in 2 children in the 4th and 5th years of follow-up, respectively; in both the primary complex was calcified at the time of the diagnosis. Extrapulmonary complications occurred in 6 children, 3 of whom had tuberculous meningitis and 3 had skeletal tuberculosis. Two of the 38 children, up to 1 year of age, and 2 of the 139 children, between 2 and 5 years of age, died, representing an over-all death rate of 1.4% or a rate of 2.3% among children less than 6 years of age. Three of the 4 deaths resulted from tuberculous meningitis, and 1 from widespread skeletal tuberculosis.

In the young child primary tuberculosis carries 2 grave risks: (1) hematogenous dissemination, often associated with extensive enlargement of lymph nodes, and (2) permanent bronchopulmonary dam-

age in the wake of a segmental lesion. In the older child the condition is more benign, with progression to tertiary disease the most common complication, the risk being greatest in patients whose cases are complicated by pleural effusion or in whom calcification has appeared. Chemoprophylaxis of dissemination is indicated in children aged less than 2 years with established primary infection, but BCG vaccination of children born into a tuberculous environment is recommended as the more rational preventive measure. Surgical intervention, unless acute respiratory distress supervenes, is necessary only when irreversible bronchopulmonary damage is present.

Acquired Hemolytic Anemia Accompanied by Auto-antibodies in the Course of Leukemia in Children (Report of Cases). G. Di Piero and R. Attias. *Riv. clin. pediat.* 61:463-489 (June) 1958 (In Italian) [Florence, Italy].

Immunological studies, consisting of the direct Coombs test and serologic tests with trypsin-modified and papain-modified erythrocytes for the purpose of establishing the presence of immune, active antibodies, were conducted on 15 children with leukemia associated with acquired hemolytic anemia. Tests with trypsin-modified and papain-modified erythrocytes were performed at temperatures of 4 and 37 C on specimens of red blood cells of group O, Rh-positive genotype. "Fixed" or circulating immune antibodies, active only at the temperature of 37 C, were revealed by serologic tests only in 3 patients. This finding was supported by the observed increased range of serum bilirubin values and by the presence of hemolysis revealed through the indirect reaction test of van den Bergh in 3 patients, as well as by the presence of urobilinuria, by the positivity of the direct Coombs test, and by the presence of anemia of varying degree in 2 patients. Serologic tests were negative in 4 children at temperatures of 4 and 37 C and were inconclusive in the remaining 8 children at the temperature of 4 C. The bone marrow did not represent in any of the 3 patients with positive serologic tests a "duality of proliferation," that is, the existence of hyperplasia of erythroid and lymphoid elements existing side by side, as observed by Rosenthal and co-workers in the United States. Enlargement of the spleen was noted in one patient in this series, which symptom is, according to some workers, evidence of the presence of auto-antibodies in adult patients with leukemia. The authors believe that one cannot compare the hemolytic processes taking place in the course of leukemia among adults with those among children, because the underlying disease runs a very acute course in children but progresses more slowly in adults.

Right Heart Catheterization in Infants and Children: Analysis of Data Obtained in the Study of 218 Patients. B. W. Fink, A. J. Moss, F. H. Adams and B. J. O'Loughlin. *J. Pediat.* 53:566-570 (Nov.) 1958 [St. Louis].

Catheterization of the right heart was performed on 218 infants and children at the Medical Center of the University of California at Los Angeles during the period from July, 1955, to March, 1957. The patients ranged in age from 1 day to 15 years. Eighty-five of the patients were under 2 years of age. All were hospitalized and observed for a minimum of 2 days prior to the catheterization study. Preoperative preparation usually consisted of penicillin prophylaxis and premedication with atropine and Demerol. Thiamylal (Surital) sodium was administered rectally in a dosage sufficient to maintain a basal state of anesthesia (33 mg. per kilogram). The catheterization was performed under fluoroscopic control with a Westinghouse image amplifier and with lead screening strategically positioned in order to offer the maximum protection to the operating personnel.

The pulmonary artery was entered in 73% and the left atrium in 38% of the studies. The procedure was found to be reasonably safe, even in small infants who are critically ill. Seventy-seven of the patients had lesions that were considered correctable by surgery. Assuming that the findings at surgery represented the correct anatomic diagnosis, the authors found that the clinical impression, based upon history, physical examination, roentgenography, and electrocardiography, was accurate 74% of the time. The additional information gained by cardiac catheterization increased the accuracy of the diagnosis by 17%, that is, to 91%. The authors believe that this procedure is an invaluable aid and that it should be utilized in selected cases regardless of the age or the physical condition of the patient.

Rheumatic Pneumonitis: Part II. Report on the Clinical and Laboratory Findings in 23 Patients. D. Goldring, M. R. Behrer, G. Brown and G. Elliott. *J. Pediat.* 53:547-565 (Nov.) 1958 [St. Louis].

The authors present observations on 23 patients with rheumatic pneumonitis, whom they observed in the course of the past 8 years. The patients ranged in age from 4 to 14 years. Sixteen of the 23 patients died, and the diagnosis was verified by autopsy. Seven patients survived, and evidence is presented to show that this rheumatic manifestation can be diagnosed during life. The clinical course of each of the 23 patients was analyzed. Electrocardiograms and serial roentgenograms were studied when available. All patients were treated in essentially the same manner. Twelve patients in group 1 (nonsurvivors) and 3 in group 2 (survivors) were given aspirin on the basis of 0.14

Gm. per kilogram per day in 4 divided doses. Seven patients in group 1 and 5 in group 2 were treated with cortisone or Meticorten, and 1 patient was treated with corticotropin (ACTH). All patients received penicillin and streptomycin. All were digitalized with digitoxin (0.033 mg. per kilogram total dose; maintenance, 10% of total dose per day) and kept in oxygen tents. Morphine sulfate and Mercuhydrin were used when indicated. Blood and throat cultures were initially made in all patients.

The authors conclude that rheumatic pneumonitis is associated with the severe form of rheumatic fever and is a grave prognostic development. This rheumatic manifestation is a serious threat to survival, and those who survive are left with severe residual heart disease. There is a suggestion that hormone therapy may improve the chance of survival and possibly reduce the severity of the residual heart disease in the survivors. Although its efficacy is disappointing, the authors feel that hormone therapy should be included in the treatment of any child with severe rheumatic fever.

PATHOLOGY

Electron Microscopic Examinations of Renal Biopsy Material from Two Patients with So-Called Genuine Lipoid Nephrosis. O. Z. Dalgaard. *Ugesk. læger* 120:1358-1363 (Oct. 9) 1958 (In Danish) [Copenhagen].

Renal biopsies from a girl aged 16 and a youth aged 17 with so-called genuine lipoid nephrosis were examined by electron microscopy and usual light microscopy. While light microscopy showed nothing abnormal in the glomeruli in one case and only slight thickening of the capillary walls in the other, electron microscopy revealed marked glomerulus changes in both cases. There was no organization of the epithelial cytoplasm into foot processes. Capillary loops were covered with a low epithelial cytoplasm. The epithelial cells were filled with vacuoles. In Bowman's capsular space formations were seen suggestive of detached foot processes. The basement membrane had a moth-eaten look in some places and nodular thickening in other places. There was an accumulation of material like basement membrane in the cytoplasm of the endothelial cells. The hyaline droplets in the cells of proximal tubules were converted mitochondria. In the second case biopsy after 15 days' treatment with ACTH, during which the proteinuria fell from 15 to 0.5 Gm. per 100 cc. daily, showed that epithelial cells in the glomeruli had become normal. The normalization of the cytoplasm after treatment with ACTH suggests that the immune-allergic reactions in so-called genuine lipoid nephrosis are localized especially to these cells.

ANESTHESIA

Collapse from Spinal Analgesia in Pregnancy. B. Williams. *Anesthesia* 13:448-453 (Oct.) 1958 [London].

The susceptibility to spinal analgesia of patients undergoing cesarean section has been responsible in the past for serious or sometimes fatal collapse. There are 2 factors in pregnancy which predispose towards collapse from spinal analgesia. The first is an increase in the neurogenic tone which maintains blood pressure, a tone which is easily disturbed, and the second is the tendency towards hypotension and collapse which occurs in some patients in late pregnancy if they are kept lying on the back for any length of time. These factors should be taken into consideration. Patients showing any degree of postural hypotension should be considered unsuitable for spinal analgesia. In others, analgesia should be kept to the lowest possible level by limiting the dose of the drug, and by using a smaller dose than that used in non-pregnant patients to obtain the same level of analgesia. It is unnecessary for the analgesia to reach higher than the level of the umbilicus, and if a transverse incision is used it can be one or two segments lower. In keeping the level low the possibility must be faced of the analgesia being incomplete at the upper end or delayed in onset resulting in the need for supplementary local or general analgesia. Oxygen should be administered throughout. A careful watch must be kept on the circulation. Deaths must have occurred when a single-handed surgeon has administered the anesthetic and no one has been available to watch for the early signs of circulatory collapse. If hypotension occurs early, the patients' legs should be raised vertically, or, if at a later stage, the head of the table should be lowered.

Ventricular Fibrillation During Hypothermia: Further Observations. A. B. Kortz. *Am. Surgeon* 24: 693-699 (Oct.) 1958 [Baltimore].

A technique of inducing hypothermia in the dog and performing a right ventriculotomy under conditions of inflow-outflow cardiac occlusion is described. This technique parallels that used in performing cardiotomy in human patients, and as such is recommended for investigative purposes. A method of arresting the heart and preventing ventricular fibrillation under the above conditions is described, using an intracoronary perfusion of Ambonestyl and Urecholine. Atropine sulfate is shown to be an effective antidote. Evidence is offered which suggests that a seasonal variation in success might be expected. The canine myocardium seems more irritable in the summer than in the winter. It is suggested that reports of investigations on ventricular fibrillation in the canine heart bear the dates during which such investigations were undertaken.

BOOK REVIEWS

Electrolyte Changes in Surgery. By Kathleen E. Roberts, M.D., Assistant Chief of Medicine, U. S. Public Health Service Hospital, San Francisco, Parker Vanamee, M.D., Assistant Attending Physician, Memorial Hospital for Cancer and Allied Diseases, New York, and J. William Poppell, M.D., Chief, Section of Cardio-Pulmonary Physiology, and Associate, Sloan-Kettering Institute for Cancer Research, New York. Publication number 317, American Lecture Series, monograph in Bannerstone division of American Lectures in Physiology. Edited by Robert F. Pitts, M.D., Ph.D., Professor of Physiology and Biophysics, Cornell University Medical College, New York. Cloth. \$4.50. Pp. 113, with 21 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

Although much of the usual material concerning water and electrolytes is presented in this monograph, emphasis has been placed on physiology pertaining to particular operations or anatomic segments. This is commendable. Of particular interest is the section entitled "Philosophy in the Diagnosis and Treatment of Electrolyte and Water Problems." The authors correctly state that strict rules cannot be followed because equilibrium in this field is a dynamic one; when one abnormality is corrected it may in turn produce another. Hence, the authors have stressed the entire electrolyte pattern in various diseases. They should be complimented on their statement that the most common electrolyte abnormality encountered in clinical medicine is the "laboratory error." The importance of clinical as well as laboratory data is emphasized. This book can be recommended to anybody interested in electrolyte changes in surgery.

A Study of Medical College Costs. By Augustus J. Carroll, Business Manager, Upstate Medical Center, State University of New York, Syracuse. Paper. \$1.50. Pp. 188, with illustrations. Association of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill., 1958.

An editorial in *THE JOURNAL*, Nov. 16, 1957, page 1459, pointed out that, while much has been said and written regarding the high costs of supporting medical schools, there is little awareness of the functions that these large expenditures make possible. Most often the expenses of supporting the complex activities of a medical school are interpreted as reflecting solely the costs of educating medical students. There is little understanding on the part of either the general public or the profession itself that many of the expensive undertakings

of medical schools are not directed solely and often not primarily to undergraduate medical students. This study presents a detailed analysis and comparison of the fiscal operations of 19 medical schools and their teaching hospitals relative to such functions as undergraduate, graduate, and postgraduate medical instruction; the instruction of nonmedical students; research; and patient and community services. Although medical teaching centers have differing programs and varying methods of fiscal management, this report indicates that these differences can be understood, defined, and compared in detail.

This study identifies the funds expended with the function served. To a degree never before possible, university and medical school administrators can look forward to an understanding of and directed relationship between the order of importance of objectives assumed and sums assigned in support of those objectives. Extension of this study to include all United States medical schools and their teaching hospitals would make it possible to present to the American public accurate fiscal information about medical education. The general public is at once both the ultimate source of medical school funds and the ultimate benefactor of the activities these funds support. A better understanding of how medical education dollars are spent rather than merely where they are spent should make everyone more responsive to the needs of medical education. Medical educators could "learn not only how other medical colleges spend money, but how they save it." Through a grant from the W. K. Kellogg Foundation, this extended study will soon be initiated under the direction of the author.

Side Effects of Drugs: Untoward Effects of Drugs as Reported in the Medical Literature of the World During the Period 1956-1957. Compiled by L. Meyler, M.D. Paper. \$5; Hfl. 19; £1.16. For Excerpta Medica subscribers: \$3.50; Hfl. 13.50; £1.5.6. Pp. 194. Excerpta Medica Foundation, 111 Kalverstraat, Amsterdam-C, Netherlands; 2 E. 103rd St., New York 29, 1958.

The material in the second edition of this annual publication is presented in abstract form for each drug under its official or otherwise recognized nonproprietary (generic) designation, with synonyms, including trademarks, shown parenthetically. The drugs are arranged alphabetically according to nonproprietary name and organized into chapters according to their pharmacological or clinical

classification. The references which are cited by annotations in the text are listed at the end of each chapter. A cumulative general index of the names, synonyms, and classes of drugs for which literature is cited, covering the previous and current editions of the publication, appears at the end of the book, with page references to the first edition in italics. This publication has been faithfully compiled and should serve as a valuable reference to previously reported drug reactions. To have called this book "Adverse Effects of Drugs" would more clearly have reflected the emphasis that is placed on untoward reactions. Although not useful as a source of information on newly encountered adverse effects of drugs, it should fulfill the need for a condensed and broad compilation that can be used in the interpretation of confirmatory and unreported observations in this area. The obvious preference for British nomenclature and spelling, including trademarks, is likely to lessen its appeal and engender some confusion in drug terminology for American users. The diction and printing are clear, although the distinction between the italicized and plain page numbers of the index might have been clarified by a difference in type size. Although the paper binding may detract from its permanence as a library reference work, this book should prove to be an excellent reference to published information on the subject.

The Ureterovesical Junction: The Theory of Extravesicalization of the Intravesical Ureter. By John A. Hutch, M.D., Clinical Instructor of Urology, University of California, San Francisco. Cloth. \$7.50. Pp. 178, with 96 illustrations. University of California Press, Berkeley 4; Cambridge University Press, Bentley House, 200 Euston Rd., London, N. W. 1, England, 1958.

The title of this monograph is misleading because the material covered embraces much more than a classical discussion of the structure, function, and lesions of the ureterovesical junction. The author has assembled a clear, understandable concept of the cause and treatment of nonobstructive dilatation of the upper urinary tract and its associated phenomenon—reflux of urine. This is in contrast to most monographs on neurogenic changes of the lower urinary tract which contain a confusing compound of varying theories and concepts of cause, classification, and pathological changes. In part 1 the author deals exclusively with the spastic neurogenic bladder and explains why the patient who sustains a transection of the spinal cord may develop hydroureter, hydronephrosis, reflux, and uremia. He has studied a large number of paraplegic patients and, from this extensive experience, has developed the hypothesis of upper urinary tract dilatation. In part 2, the ideas developed in part 1

are used to explain the upper urinary tract dilatation and reflux occurring in conditions other than those associated with the spastic neurogenic bladder. This work is adequately illustrated, from both a diagnostic and therapeutic point of view. Hutch's ureterovesical plastic operation, by which he creates an intravesical ureter, is clearly described and preoperative and postoperative pyelograms are used to show the correction of reflux. This monograph can be read with great profit by all physicians called on to treat neurogenic or obstructive lesions of the urinary tract. Those most interested would be urologists, neurologists, pediatricians, and neurosurgeons. The work is a classic and the author is to be congratulated on its excellence.

The Endocrinology of Reproduction. Edited by Joseph Thomas Velardo. Contributors: Frank D. Allan, Ph.D., and others. Cloth. \$15. Pp. 340, with illustrations [by Robert C. Wabnitz]. Oxford University Press, Inc., 114 Fifth Ave., New York 11, 1958.

In attempting to present a relatively clear and useful summary of the available information and existing problems in the field of reproduction, the authors have succeeded remarkably well, despite the admitted complexity of the subject matter and the fact that research involving some aspects has been extremely fruitful during the past few decades. Among the topics covered in separate chapters are the genetics of reproduction, embryology of the reproductive system, pituitary and hypothalamus, mammary gland development and function, and the dynamics of endocrinology. The editor and authors have spent much time and effort in providing numerous references to support their conclusions and to provide source material for those who are interested in exploring certain problems in further detail. The material is well integrated and chapter delineation is good, despite inherent difficulties in achieving this when various authors contribute on similar subjects. One instance of divergent views relates to the number of pituitary gonadotrophic hormones, which seems to be clouded by reference to two in one chapter and to three in another. The book is well illustrated by both original drawings and reproductions from other sources, some in color. It is well prepared from the technical standpoint and shows excellent craftsmanship. One would hesitate to recommend this volume for the physician with only a superficial interest in the field of reproductive physiology, for it provides much more detail than he might be interested in having. On the other hand, for those specifically interested in problems of fertility this book should prove exceedingly informative, particularly in providing in one volume material that would require long and tedious hours of library research to accumulate.

QUESTIONS AND ANSWERS

MANAGEMENT OF THE NEWBORN BABY OF A DIABETIC MOTHER

TO THE EDITOR:—In THE JOURNAL, June 14, 1958, page 923, there was a question and answer relating to the management of the newborn infant of a diabetic mother. It was stated that the four greatest dangers to such an infant were hypoglycemia, anoxia, lethargy, and prematurity. Although the literature on this subject is sparse, more recent work than that quoted would indicate that the greatest problems in such an infant are prematurity and its complications and a predisposition to severe respiratory distress. The problem of hypoglycemia has not proved to be as serious as it had been presumed. Dr. Jorgen Pedersen of Copenhagen, in his booklet "Diabetes and Pregnancy," reports a study of the blood sugar level in relation to the normal newborn infant. He found all newborn babies to have blood sugar levels lower than what is generally considered normal and newborn infants of diabetic mothers to have only a slightly lower level than other normal babies. He believed this problem to be clinically unimportant. This agrees with the report of Graham and Lowrey. They stated that, in a series of 11 such infants, hypoglycemia with levels below 20 mg. per 100 ml. was present in two but that none had clinical symptoms. They also cited White and other investigators who have given up the use of sugar in these babies. In the 13 babies I have seen at the Virginia Mason Clinic, there was no clinical evidence of hypoglycemia.

This is an important point, since one is primarily dealing with a large, premature infant delivered four to six weeks early by induction or section. Such an infant has a tendency to develop severe respiratory distress within the first three days of life, generally of the "hyaline membrane syndrome" type. Early feeding is contraindicated. It has been the practice to withhold feedings for 24 to 72 hours; this is diametrically opposed to the procedure recommended by the

consultant. There have been no complications at this clinic from this treatment, and only one death (from respiratory distress) has occurred. The subject should at least be kept open.

Donald Lewis, M.D.
738 Broadway
Seattle 22.

The above comment was referred to the consultant who answered the original question, and his reply follows.—ED.

ANSWER.—In the answer to the query, the study of Reis, De Costa, and Allweiss (Diabetes and Pregnancy, Springfield, Ill., Charles C Thomas, Publisher, 1952) was cited. In a reevaluation of the question of pregnancy in the diabetic woman, Reis, De Costa, and Gerbie (*Am. J. Obst. & Gynec.* 76:1148, 1958) said:

Although we have preferred prophylactic oral glucose feedings for the newborn, our present attitude is less rigid than heretofore. There remains a difference of opinion concerning such feedings, and it seems that those who advocate starvation for the first 24 to 48 hours achieve practically the same fetal salvage as do those who insist on routine feedings begun immediately after birth. It should be noted, however, that some groups are now feeding "sick" newborn infants of diabetic mothers promptly and continuously with glucose in saline solution. It may well be that our original recommendation still has merit. The most important principle in the care of the newborn of diabetic mothers is still found in the recommendations previously made that they must be treated as premature regardless of size, that special attention be given to predelivery analgesia and anesthesia, together with intubation, aspiration of the trachea, and postural drainage to prevent respiratory embarrassment. It is equally important to maintain body heat, avoid anoxia, and to continue constant stimulation of these babies during the first 48 hours of life.

Allweiss, an internist, stated in answer to the above letter that it is agreed that the subject of the management of the newborn infant of the diabetic mother should be kept open. Prematurity and its complications and predisposition to severe respiratory distress from the "hyaline membrane syndrome" are indeed of paramount importance. The questioner, however, directed his query to the hypoglycemic factor. The lowest blood sugar level of the infant from a diabetic mother occurs in the first hour of life and gradually rises. Attention has been called to the fact that no clinical symptoms are associated with the hypoglycemia. It is felt, however, that a blood sugar level below 20 mg.

per 100 ml. may easily be treated in these infants by simple oral intake, provided there is no respiratory distress. Should there be respiratory distress, dextrose can be given subcutaneously. The reasons for treating the hypoglycemia are as follows: It may be a factor in neonatal death, even without clinical symptoms. It may be a factor in central nervous system damage in the child and adult. The damage to an infant is not known. Perhaps the nervous tissue in the young can withstand insult, for there are physicians who do not treat the baby with glucose and they report no immediate central nervous system damage. Since treatment of the hypoglycemia is so simple and may prevent central nervous system damage, which can now be detected, the use of glucose seems to be justified.

INDURATION OF CORPORA CAVERNOSA (PEYRONIE'S DISEASE)

TO THE EDITOR:—A 54-year-old man was subjected to colostomy and rectal resection for carcinoma, grade 2, of the rectum, which had not penetrated the muscularis. No metastases were found in the blood vessels or lymph glands. After removal of the Foley catheter eight days after the operation, the patient complained of burning on urination for three or four weeks. Repeated urinalyses gave negative results. Now, after one year, the patient complains that the penis, on erection, tends to arch downward in the shape of a bow. No indurations can be palpated. There is no evidence of stricture from his history, but no sounds have been passed. Please suggest diagnosis and treatment.

M.D., Mississippi.

ANSWER.—The available data would indicate that the patient is suffering from Peyronie's disease (fibrous cavernositis, plastic induration of the corpora cavernosa, fibrous sclerosis, fibrous plaque of penis). In this condition, for reasons unknown, a dense hyalinized connective tissue plaque develops between a fascial sheath of the penis (Buck's fascia) and the tunica albuginea surrounding the corpora cavernosa, resulting in painful or painless deviation of the erect organ. Two aspects in the above-described case are unusual, namely, the absence of a palpable plaque and chordee (ventral deviation of the erect penis). In the majority of instances of this disease, a plaque can be detected behind the coronal sulcus straddling the corpora cavernosa and deviation of the erect penis is dorsal, dorsolateral, or lateral. A plaque situated in the septum between the tunica albuginea, however, would not be palpable and would result in chordee; such cases have been reported infrequently. The onset of this condition after resection of the colon and the use of an indwelling urethral catheter would appear entirely fortuitous. For the sake of completeness, however, it would appear advisable to carry out urethral calibration and urethroscopy.

It is conceivable that the traumatic passage of a urethral catheter, which is left indwelling, may result in periurethritis, urethral stricture, or both. Chordee as a result of these conditions, however, is extremely rare. Finally, metastasis from carcinoma of the colon to the penis, as a cause for chordee, occurs extremely infrequently and usually results in a palpable mass.

The etiology of Peyronie's disease is obscure, and consequently a variety of forms of treatment have been suggested. These include internal medication, roentgen therapy, radium therapy, steroid injections, diathermy, massage, hyaluronidase, electrolysis and ultraviolet radiation, and surgery. Only the first four forms of therapy have been used widely, and in this particular case it would appear that only the first two are applicable. The oral administration of alpha tocopherol, 100 mg. three times daily for a period of six to eight months, is suggested. Roentgen therapy with moderate doses should be given. The use of radium is losing acceptance because of the inability to protect the gonads adequately in spite of shielding. The inability to define a plaque would contraindicate multiple injections with cortisone. The consensus is that relief of chordee by any method of treatment occurs in approximately 30% of cases.

HYPERTHYROIDISM IN INFANTS AT BIRTH

TO THE EDITOR:—In 1954, a woman developed amenorrhea which persisted for about six months. The basal metabolic rate at that time was -20% and protein-bound iodine level 2.8 mg.%. She was started on therapy with 1 grain (60 mg.) of thyroid. Her menstrual periods returned and her basal metabolic rate increased to -8%. She had what was felt to be a simple goiter, because of a diffuse boggy enlargement of the thyroid. She became pregnant, and the thyroid dosage was increased to 2 grains (120 mg.) daily and she was given strong iodine solution, 20 minims, throughout her pregnancy. A full-term baby was born with a tremendously enlarged thyroid, completely occluding the larynx. The baby smothered. It was impossible to pass a tube into the baby's larynx because of the large thyroid. Histological examination of the thyroid showed follicles which contained no colloid and which were lined by tall epithelial cells. There was no evidence of malignancy. The patient was then placed on therapy with 2 grains of thyroid daily.

She again became pregnant, with her expected date of confinement 16 months after the previous delivery. At that time she was given thyroid until hyperthyroid levels were reached; the thyroid dosage was then decreased to 5 grains (300 mg.) daily. She was also given strong iodine solution, 30 minims daily. The thyroid therapy was started at the second month of gestation.

When the mother reached term, again the baby was born with an enlarged thyroid, but not nearly as large as that of the first baby. From the onset the baby was fussy and had a temperature of 100 F (37.7 C), a terrific appetite, rapid pulse rate, and loose stools. Because of the history, it was felt that the baby was most likely in a hyperthyroid state and she was given 1 minim of strong iodine solution three times a day. When the baby was two months old, a butanol extractable iodine test gave a finding of 6.8%, indicating moderate hyperactivity of the thyroid gland. The baby is now 13 months old and has developed normally but still has a markedly enlarged thyroid gland. She is taking 6 minims of strong iodine solution daily.

On Nov. 25, 1957, the mother again became pregnant; a similar course of therapy was followed during this pregnancy. Late in pregnancy, she developed a severe stomatitis and dermatitis which disappeared after the strong iodine solution was withdrawn. Her first visit with this pregnancy was on Feb. 28, 1958, and, from her last period on Nov. 25, 1957, her thyroid dosage was just 2 grains daily. On Sept. 20, she delivered a baby girl normal in weight and size. Again, the baby had a tremendously enlarged thyroid and showed symptoms of hyperactive thyroid. Therapy with strong iodine solution was again initiated, but the baby could not tolerate more than 1 drop of iodine daily. She has a tremendous appetite and is being breast fed, whereas the other baby was fed by bottle.

In view of the thyroid difficulties this patient seems to have and the scarcity of material in the literature covering such a case, please suggest what might be done to care for these two hyperthyroid infants. Should radiation or radioactive iodine therapy be considered? What therapy should be given to the mother in the event she again becomes pregnant? She had had two normal pregnancies before the thyroid condition began. When she is not pregnant she has a tremendously enlarged thyroid gland and requires 2 grains of thyroid daily for maintenance. During her pregnancy, presumably because of the thyroid activity of the baby, her thyroid gland becomes nonpalpable. This is despite the fact that she is taking enough thyroid to produce hyperthyroid symptoms during her pregnancy. Should the mother have a thyroidectomy?

M.D., Montana.

ANSWER.—Hyperthyroidism in infants and children is an unusual condition. There is essentially no literature concerning hyperthyroidism in newborn infants. The patient in question here has undoubtedly given birth on three consecutive pregnancies to infants exhibiting well-established hyperthyroidism at the time of delivery. She, herself, has

treated hypothyroidism. With respect to the mother, both currently and in the event of future pregnancies, the combined therapy with both thyroid and strong iodine solution would suggest little advantage over thyroid alone. Indeed, the addition of regular daily doses of iodide could only serve to aggravate the intrauterine hyperthyroidism of the fetus. Somewhere after the 14th or 15th week of pregnancy, the placental barrier to transmission of iodide begins to diminish. As in severe hyperthyroidism in the older patient, one must assume that the effect of iodide on the fetal hyperfunctioning thyroid can only be one of temporary suppression with eventual "breakthrough" and aggravation by supplying the necessary iodide substrate. By contrast, treating the mother with thyroid in a meticulous fashion to the point of euthyroidism or even very mild hyperthyroidism, as was established in the last pregnancy, would serve the function of limiting the maternal influence to one of suppressing the fetal thyroid. Replacement therapy with strong iodine solution should have corrected the mother's condition if this were due to iodine deficiency. Thyroidectomy should have no bearing on the subsequent course of either the mother's thyroid state or future pregnancies. Adequate therapy with thyroid alone for the mother is suggested.

With respect to the infants, the treatment of hyperthyroidism here presents all the problems of juvenile hyperthyroidism in an exaggerated fashion. In this most active growth period the detriment due to overactivity of the thyroid must be corrected, but at the same time the institution by any therapy of life-long myxedema must also be avoided. Disturbance of thyroid function in either direction in very young children is a far more serious state of affairs than generally appreciated. There is, of course, no absolute contraindication to either surgery or radioactive iodine therapy in such conditions, but these should be the last and most desperate measures undertaken in the infant. Again, strong iodine solution as a therapy could hardly be expected to result in anything but mild hyperfunction. The use of medical therapy in the form of antithyroid drugs for as long as possible would seem to be the most promising answer here. The goitrogens that include organic iodide as part of their structure (e. g., 2-mercaptoimidazole) would afford the opportunity of regulating thyroid function at a normal level and at the same time prevent the appearance or progression of a goiter. While radioiodine uptake, blood levels of protein-bound iodide and cholesterol, and basal metabolic rate may all prove useful, the criteria of normality at this age are probably unreliable. The absence of general symptomatology and a steady progression of growth should be the most reliable indexes of adequate thyroid suppression. In all likelihood, the dosage of antithyroid drug will have to be continually checked and adjusted as growth of the

patient occurs. It is suggested that all therapy be interrupted at intervals of one year or 18 months to see whether the underlying condition has not disappeared. A sizable proportion of older patients with hyperthyroidism experience complete or long-term remission after a prolonged period of strict medical therapy. Again, one cannot predict what will happen for these ~~various~~ patients, but they should be afforded the opportunity of achieving any such possible remission at yearly or bi-yearly intervals.

HYPERSENSITIVENESS OF THE INTESTINE TO EMOTION

TO THE EDITOR:—In most patients, the syndrome of "spastic colitis" or "nervous indigestion" seems to subside or, at least, the patients acquire control of it. However, in a 54-year-old patient there may be a familial tendency to hyperperistalsis, since the father and several brothers and sisters had the symptoms of spastic colitis. For 25 years, the patient has been progressively restricted in his diet. At first a few foods caused abdominal distress, audible peristalsis, and constipation, the worst flare-ups coming with periods of stress. While on vacations, however, the patient could eat everything. This is no longer true, and now there is a feeding problem. In the last 10 years, the patient has become sensitive to small amounts of listed foods. At first he could cut down on popcorn to one handful, pickles to one, and similar foods to small amounts and get by. Lately, however, some important foods, such as lettuce, bananas, and oranges, have been added to the list. He can still drink orange juice, but after a well-chewed orange is swallowed the pulp is passed visible in the stool practically unchanged in 18 to 24 hours. Antispasmodics have never helped; in fact, he has low tolerance for all of them.

X-rays of the colon have been done three times in the last 15 years, and each time a large, normal, well-filled colon without spasm anywhere was noted. Several sigmoidoscopies have also shown negative findings. The patient is interested in physical fitness and exercises to keep ready for hard vacations. Although fats and starches seem to improve the condition, they cause him to gain weight rapidly. Could a gradually acquired deficiency of digestive enzymes cause the progression of these symptoms?

Frank C. Green, M.D., Chillicothe, Ill.

ANSWER:—This case report suggests a typical hypersensitiveness of the intestine to emotion. The most significant statement, "While on vacation the patient could eat everything," rules out food allergy. The long duration of the symptoms tends to rule out organic disease of the intestine. It is doubtful that the trouble of such patients is really spasm in

the colon. In nervous persons, the descending colon always looks contracted, so that does not mean anything. At the Mayo Clinic, roentgenologists do not mention colonic spasm from one 10-years' end to another. Interestingly, it is stated in this case that x-ray studies show no colonic spasm and antispasmodic agents do not help. This was learned 40 years ago, and this consultant never uses such drugs. The fact that the patient tends to gain weight and now has to cut down on his diet shows that his absorptive and metabolic processes are excellent—in fact, too good. He cannot then have any deficiency in his digestive enzymes.

In hundreds of similar cases, the patient will get along comfortably with his intestine (the trouble is not limited to it) for a week, and then when, perhaps, he has to go out to dinner with friends, has to entertain guests in his home, or, in the case of physicians, has to give a paper at the county medical society he bloats with gas. In many cases, this is the essential beginning symptom. If the gas cannot quickly be passed, for reasons of politeness, it causes hyperperistalsis, and with this there keeps coming more gas with a little water and mucus that must be voided every 20 minutes if the person is to stay comfortable. Many young men and women have most of their trouble of this type when they are sexually excited and perhaps have had coitus. The storm in the pelvic nerves spreads to the colon. In these cases, a diet is never prescribed, because the trouble is due not to food and indigestion but to emotion. Many persons, if they are going to be under heavy strain, should take $\frac{1}{2}$ grain (0.03 Gm.) of codeine before they go out for the evening. Even this amount will often stop the formation of gas and mucus and will let the person be comfortable.

Many persons ask, "Where does the gas come from?" It is excreted from the blood into the lumen of the intestine. In health, the gas moves out of the intestine into the blood and is excreted by the lungs. This is why the normal person rarely has any flatus. The inquirer is referred to the chapter on flatulence in the book by Alvarez, "An Introduction to Gastroenterology" (New York, Paul B. Hoeber, Inc., 1948). Department of Harper & Brothers, 1948).

IDIOPATHIC SPASMODIC TORTICOLLIS

TO THE EDITOR:—A 40-year-old woman complains of what appears to be a tic of the cervical portion of the latissimus dorsi and related cervical groups. The head nodding is up and down, with coarse movements markedly accentuated as to frequency and amplitude when the patient is self-conscious. This condition occurs about once daily and lasts for several hours. At the age of 17 this patient contracted syphilis. She was under competent neurological care until five years ago, when her neurologist died. She had a thyroid-

ectomy five years ago, after which she developed tetany. In the past 10 years, she has had numerous somatic complaints and, in general, sedatives have been of some help. She has had some difficulties with her husband in the psychosexual sphere. She was treated by a competent analyst for two years, during which time chlorpromazine therapy was used.

Examination revealed slight hypertrophic arthritis of cervical vertebrae; low estrogenic effect reported on vaginal smear; pupils accommodated but not responsive to light; blood and spinal fluid Kahn test, negative; colloidal gold test, 0000000000; spinal fluid cell count, 12 per cubic millimeter; protein level, 1+; and sugar level, 70 mg.%. Over a period of years, the patient has received amobarbital ventilation, chlorpromazine, estrogens, diphenylhydantoin, calcium gluconate, ethopropazine, mephenesin, and reserpine. She had galvanic therapy and large doses of vitamin B₁₂. For a short time a plastic collar was used in an attempt to rest the cervical muscles. All these efforts have been to no avail. The patient still has her tic, and cervical traction has been considered. Please give advice as to therapy.

Milton Vainder, M.D., Chicago.

ANSWER.—The history and findings in this case indicate a diagnosis of psychoneurosis, psychasthenic type, with tic of the head, and central nervous system syphilis, with the only clinical finding of loss of pupillary reaction. The described movements of the head are seen most frequently in psychasthenia with compulsive tic. The fact that the tremor is "up and down" and that it appears worse when she is embarrassed would stamp this as an "acting out" of a defense mechanism. There are no other evidences of neurological disease except for the pupillary reaction. Syphilis itself would not produce the tremor of the head without other symptoms or signs. The hypertrophic arthritis in the cervical vertebrae aggravates the preexisting tic.

Mechanical or physical therapy should not be used, since the tendency would be to "fix" the tremor. It appears that the patient is using her tic as a defense to an already intolerable situation, i. e., the psychosexual difficulty with her husband. Concentration on mechanical therapy aimed to improve the tic will lead to a more persistent habit spasm. The best therapy would be psychotherapy. The patient will need to accept her tremor until the underlying problem is solved. Explanation and suggestion should be attempted. Good sedative medication and tranquilizers will be helpful in decreasing her tremor but will not "cure" the present problem. It will be helpful to see the patient's husband to try to get at the base of the conflict, and this will be useful in treating the patient—and perhaps the husband. The fact that the patient has had this condition for many years, has many somatic complaints, and has

used many types of therapy would indicate the severity of the neurotic pattern. Also, the fact that the tic becomes more pronounced in the face of embarrassment and without neurological disorder (such as Parkinson's disease) would also be an indication of psychoneurosis.

ANSWER.—From the description given, this condition best fits the category of idiopathic spasmodic torticollis. This relatively rare disorder occurs usually in females in the fourth or fifth decade and is characterized by sustained contractions of the neck muscles, either tonic or clonic, in varying degrees. The clonic activity may be an irregular tic. It may be either unilateral or bilateral, sometimes with head nodding. It is absent during sleep. Pain may develop in severe cases. Electromyographic findings may correspond to dystonic movements. The condition may remain unchanged or may become worse, and improvement is rare. Spontaneous remissions occur in few patients. It is the opinion of some neurologists that this condition is due to extrapyramidal disease, but postmortem evidence is scarce and pharmacological aids are usually of no avail. These movements are aggravated during periods of stress for the patient. They need not interfere with work or the capacity of the patient to function in society, but withdrawal from occupational and social life is common. It is possible that further effort to help this patient understand her drives and motivations, as well as attempts to modify the environmental setting of her difficulties, may alleviate her symptoms. The emotional support of a physician may help. It is not advisable to section nerves or use traction or other mechanical manipulative procedures.

EXERCISE AFTER CORONARY OCCLUSION

TO THE EDITOR:—A patient, aged 51, completely recovered from a first coronary occlusion with no congestive heart failure, no angina, normal blood pressure, no arrhythmia, and no other complications. May such a patient take mild exercise? If so, how soon may he exercise after the occlusion? Besides walking, would mild calisthenics and bending and stretching exercises be permitted? What about dancing and climbing stairs?

M.D., Pennsylvania.

ANSWER.—This consultant permits his patients to begin moderate physical activity two to three months after a good recovery from uncomplicated coronary occlusion. Mild exercise, such as walking, playing golf, and perhaps even climbing slowly is not only permitted but actually encouraged. Participation in any activity, be it mild calisthenics, walking, or swimming, must be approached gradually; reasonable increases from week to week must be dependent on the tolerance of each patient, and no exercise must be allowed to produce fatigue or

other symptoms. With these precautions in mind, calisthenics that require slow and simple movements, walking, and moderate swimming are all good forms of exercise. Dancing and climbing stairs are merely different forms of exercise and, provided they do not produce angina, shortness of breath, or similar symptoms, may be performed perfectly safely.

ANSWER.—It has been suggested on the basis of limited epidemiologic and experimental studies that physical activity may retard atherogenesis and lead to clinical manifestations which are less severe than in comparable sedentary subjects. The validity of the epidemiologic evidence has recently been seriously questioned by investigators of parameters not previously explored in this regard. Experimental data is scanty and inconclusive. The problem relating to the patient described must, therefore, be resolved on the basis of clinical judgment and common sense. When a patient has made a complete recovery from a myocardial infarct, there is no objection to resumption of physical activities incident to every day living, provided such exertion leads to no symptoms, such as angina or dyspnea. Walking, limited stair-climbing at a sensible rate, and slow ballroom dancing fall into such an acceptable category. Golf is ordinarily a permissible sport. It is doubtful whether it is ever advisable to suggest a program of calisthenics or "body building" to a sedentary person who has not been in the habit of engaging in such activities prior to the appearance of clinical coronary artery heart disease.

MOUTH BREATHING

TO THE EDITOR:—A man, aged 65 years, has had the following complaints increasing in intensity for over six years. He states that after approximately one hour's sleep he is awakened by a foul taste in the mouth and his tongue becomes rough and "stiff as a board." The disturbance disappears when he sits up for about 10 minutes. This continues several times during the night, with headaches and fatigue. He also feels a "lump" in the mouth "moving in different directions," with the face stiff and numb. His history shows that he has had asthma intermittently since 1927. Please give suggestions on diagnosis and treatment.

Arthur M. Parker, M.D., Brooklyn, N. Y.

ANSWER.—This patient apparently suffers from mouth breathing, probably induced at least in part by allergic rhinitis with polyposis. Mouth breathing, especially during sleep, is apt to cause dryness of the mouth and tongue. After waking and sitting up the patient probably reverts to nasal breathing, and after the tongue becomes moist again he is

able to go back to sleep. The impact of this disturbance on the patient is likely to be intensified by introspection and anxiety engendered by failure of medical treatment to give relief. The recommended treatment includes explanation to the patient of the probable mechanism of his distress, treatment of allergic rhinitis and polyposis by his otolaryngologist, and, for temporary relief and as a therapeutic test, the use of nose drops with naphazoline hydrochloride at bedtime and, if necessary, during the night.

ROUTINE PRENATAL BLOOD GROUP DETERMINATIONS

TO THE EDITOR:—A mother, 25 years of age, with two children, has recently delivered a third baby. On the third day after delivery, the baby developed severe jaundice and the serum bilirubin level was 26 mg.%. There was a severe ABO incompatibility, the mother belonging to group O and the baby to group A. Existence of incompatibility was not suspected during pregnancy. In spite of two exchange transfusions, the baby developed massive thrombosis and sepsis and died on the 14th day. The first baby (from another husband) had no difficulties after delivery; he is alive and well. 1. What are the chances for future pregnancies in this case? 2. Is it permissible to do exchange transfusion through the umbilical vessels on the third day? Are they not partly thrombosed by that time? 3. Would it be advisable to require routine Rh factor and ABO group determinations from both prospective parents during premarital, or at least prenatal, examinations, so that such an occurrence would not happen by surprise?

Eugene Hoffmann, M.D., Brooklyn, N. Y.

ANSWER.—In the case outlined, the death of the infant after two exchange transfusions from massive thrombosis and sepsis on the 14th day cannot be attributed directly to the ill-effects of blood-group incompatibility. Ordinarily, exchange transfusion therapy, particularly if given early and if successful in controlling hyperbilirubinemia, produces entirely satisfactory results in ABO incompatibility, as it does in cases due to Rh or other blood-group incompatibility. 1. The chances for future pregnancies in ABO incompatibility are good. In contrast to Rh incompatibility (and some of the rarer types, such as Kell, Duffy, and others), ABO incompatibility does not tend to recur in the more severe form. In addition, it does not cause late stillbirth, which is one of the disastrous results of Rh antibodies. 2. It is not only permissible but relatively easy to use the umbilical vein for repeat exchange transfusions or even for a first exchange transfusion on the third day or later. The umbilical vein has been successfully canalized as late as the sixth day, when it

seemed to be occluded by a soft clot. Gentle suction after the vein has been exposed by undercutting the umbilicus or the remainder of the cord usually removes the soft clot. Subsequent threading of the vein by the catheter is not difficult. It must be emphasized that the catheter should not be pushed against apparent obstruction in order to avoid injury to the vessel wall or detachment of a possible clot. 3. Although ABO group and Rh factor determinations as a premarital routine have been proposed, this was considered to be an impractical procedure because so many tests would be done unnecessarily (e. g., with no subsequent pregnancy) and couples might be unduly alarmed at blood group differences which actually play a relatively minor statistical role in the incidence of erythroblastosis fetalis (about 5% of infants born to such couples). On the other hand, prenatal determinations of Rh factor and ABO groups are standard procedure in almost all large obstetric services and are very much worth while. Where the record of the woman at delivery fails to give the blood groups of her husband and herself and erythroblastosis is therefore not anticipated, it is especially desirable that the baby be watched carefully for the first 48 hours for the occurrence of jaundice, which at this early time is most commonly due to erythroblastosis. The recent article by Allen (*New England J. Med.* 258:1302, 1958) suggests a routine for services for newborn children that is particularly pertinent to this discussion. Certainly, earlier exchange transfusion is desirable when jaundice appears and reaches a dangerous level, whether this be within the first day or two or even later, as is so often seen in premature babies.

HEREDITY AND PERONEAL ATROPHY

TO THE EDITOR:—In 1946, a patient was given a diagnosis of progressive neuropathic muscular atrophy (Charcot-Marie-Tooth disease). This patient's mother is confined to wheel chair bed, presenting typical advanced deformities of the joints of the ankles and legs as is described in this disease. Recently, another member of this family, a brother, requested an opinion regarding ligation of the vasa deferens for himself to avoid having a second child. His reasons included increasing muscle weakness and fatigability and his knowledge of being unable to perform the physical activities that he used to do a few years ago. Does this condition justify the avoidance of children, even if a member of the diseased family marries a member of a healthy family?

J. A. Miranda Vargas, M.D., Pittsfield, Ill.

ANSWER.—Basically, the problem is whether sterilization is justified in an instance of a hereditary neurological disease, in this case, peroneal muscular atrophy. This disease actually has many differ-

ent types of inheritance: dominant, simple recessive, and sex-linked recessive. With this family, it is somewhat difficult to ascertain the genetic factor but it could be either dominant or sex-linked recessive. The chances of inheritance are, therefore, difficult to predict, particularly since a member of a diseased family has married into a healthy family. There are many factors involved, and the more or less constant anxiety and tension about whether a child would develop the disease is not the least important. However, in view of the relative unpredictability of the situation, it is not believed that it would be really justified to recommend sterilization.

ANSWER.—Peroneal atrophy, described independently by Charcot and Marie in Paris and by Tooth in London in 1886, is one of the most clearly and definitely inherited defects. Like most such pathological traits, it is inherited in different ways in different families but most frequently as a dominant inheritance; the very fragmentary pedigree submitted suggests such a mode. If so, the patient seeking vasectomy can expect that half of his children will be affected—in other words, the chance of any of his children being affected is 50-50. Desirability of preventing reproduction depends on a variety of considerations, but, since the defect is a serious one and he already has one child, there is certainly a good case in favor of vasectomy.

FOLLOW-UP STUDIES ON POSITIVE SEROLOGIC FINDINGS

TO THE EDITOR:—A 20-year-old woman was found to have a Venereal Disease Research Laboratory test reaction positive at 16 dilutions. She was nonreactive to the *Treponema pallidum* immobilization test. As this is an unusually high titer for a biological false-positive result, what should this patient, who was recently married, be advised about further treatment? She denies previous contact, and the family history is negative.

M.D., Wyoming.

ANSWER.—Presuming that the physical examination and history, including that of parents and siblings (congenital syphilis), reveals no evidence of syphilitic infection and that the marital partner or other sex contact shows negative findings, proper management of this patient would be observation and follow-up serologic tests for at least three to four months. If the Venereal Disease Research Laboratory test continues to show positive reactions, a spinal fluid evaluation (cell count, protein level determination, and complement fixation test) and a repeated *Treponema pallidum* immobilization test should be performed. Decision as to further management should be based on findings at that time. If treatment has been or is being given, follow-up

studies must be as for a syphilitic diagnosis. A minimum of 4,800,000 units of penicillin would be considered adequate, and no further treatment would be indicated. The finding of a reaction in the Venereal Disease Research Laboratory test at a high titer and no reaction to the *Treponema pallidum* immobilization test in the presence of syphilis is rare, but it can occur. For example, in early syphilis, as a rule, the former becomes reactive before the latter. Also, treatment might have been given prior to the development of treponema antibodies, and the Venereal Disease Research Laboratory test might continue to show positive reactions for a period of time. For the patient's benefit, a reactive reagin test should be considered as due to syphilis until thorough initial and follow-up examinations have ruled out such a diagnosis. The importance of follow-up study in patients with chronic biological false-positive results must also be considered in light of the development of collagen diseases and other conditions in some of these patients.

TERMINAL STERILIZATION OF INFANT FORMULA

TO THE EDITOR:—*In the terminal sterilization method of preparing infant formula, 25 minutes should be allowed for sterilization when there is no steam pressure. How may this time be reduced by use of a pressure cooker at 5, 10, 15, or 20 p. s. i.? While this is probably insignificant, the elevation here is 1,200-1,300 ft.*

Carl E. Graner Jr., M.D., Oklahoma City.

ANSWER.—Reference to the American Hospital Association's publications on terminal sterilization might be helpful in seeking information on this subject. Infant formulas have been successfully sterilized with pressures of 7 p. s. i. (pressures in the electric cookers are between 5 and 20 p. s. i.) for a period of 10 minutes. If pressure cookers are utilized, crucial cut nipples are recommended because there is less tendency for clogging of the nipples by the solidification of the lactalbumin in the milk. The terminal sterilization of infant formulas within the home by pressure cookers is not recommended because of the tendency to clog the nipples.

ETHYLENE OXIDE STERILIZATION

TO THE EDITOR:—*What is the current status of ethylene oxide sterilization, with particular reference to conversion of a large hospital sterilizer to this technique for routine use and to adaptability to office use? No references to its efficiency for inactivation of viruses, such as that of hepatitis, have been found.* M.D., New Mexico.

ANSWER.—There is presently no evidence that ethylene oxide or other chemicals destroy the viruses that are responsible for hepatitis infections. Exposure to heat is currently the only safe procedure.

STOCK AND CAPITAL ASSETS OF GROUP PRACTICE

TO THE EDITOR:—*How do various clinics throughout the United States handle stock held by the partners in the building corporation? Is the stock sold to new partners at par value, at book value, or on an independent appraisal figure? On what basis is the stock bought and sold between retiring partners or partners who leave the clinic for other reasons?* M.D., Wisconsin.

ANSWER.—One of the difficult problems faced by group practice in the early days was that of handling fixed capital assets, such as the building, land, and equipment, in a partnership where the individual percentages varied from time to time. This was solved by having two legal entities instead of one—the operating partnership and the other a corporation to own the fixed assets, with the stock of the corporation held by the physicians in the partnership. Thus, they could keep ownership values straight. The corporation was the landlord, and the partnership the tenant. A new partner could be added without requiring an immediate investment on his part. The problem then became one of establishing a fair price in case of subsequent stock transfers. Some groups set this at par values, others worked out a graduated upward scale pulled out of thin air, while others decided such sales should be based on book value. Since none of these plans contemplated outside economic changes over which they had no control, such as the inflation of the dollar and a shift in city growth, it was only a matter of time for the price so pegged not to represent the true value of the stock. Then they were in trouble again.

There are other groups that feel their stock in the building corporation should be like any other stock investment. It should carry the possibility for gain or loss. This can only be determined to any degree of accuracy by securing an outside appraisal of the corporation's assets and liabilities. Since with such a stock there is little turnover in sales, members usually arrange to have such an appraisal made, for instance, every three to five years, and in the meantime the price of the stock is pegged at its last-appraised value. This is the best plan so far developed. It is fair to all concerned. In order to keep the ownership of the building in interested hands, most groups have a stipulation that, if any stockholder for any reason wishes to sell any or all of his stock, the other stockholders shall be given an option of purchase (usually 60 to 90 days) before the stock is offered to outsiders. In case of death of any stockholder, the executor of his estate must do likewise. If a partner should leave the partnership for any reason the remaining stockholders shall have the right to purchase his stock at the price as it is then pegged. Some groups, however, feel an exception should be made when the partner retires. They feel it is to their advantage to have him retain an interest in the clinic, so they permit him to retain his stock should he so wish.

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees



VOL. 169, NO. 7

CHICAGO, ILLINOIS

FEBRUARY 14, 1959

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PHYSIOLOGICAL TREATMENT FOR FRACTURES OF THE METACARPALS AND PHALANGES

Preston J. Burnham, M.D., Salt Lake City

FRACTURES of the distal phalanges cause little difficulty in reduction and immobilization during the period of healing. They are treated by manually molding the fragments together. A compression bandage is applied, and possibly an over-all splint is applied to prevent further injury. The "baseball fracture," or avulsion of the extensor aponeurosis insertion, is treated by flexion of the proximal and hyperextension of the distal interphalangeal joints. The remaining types and sites of fractures in the bones of the hand often result in crippled digits with little function.

Examination of the functional anatomy of fractures in the hand and of the rather frequent poor results indicate that poor control of the ray (digit and metacarpal) permit the muscle-tendon systems of the hand to distort the fracture fragments. Furthermore, the usual lack of compression over the injured area permits edema to remain throughout healing. Its result is crippling, all-invasive fibrosis. Open methods of plating and the blind methods of pinning open routes of possible infection.

The criteria for the reduction, immobilization, and future successful function of most single fractures in the hand appear to be as follows: (1) complete control of the fractured bone during reduction and healing; (2) placement of the hand so that the muscle-tendon systems are at minimal tension; (3)

In the treatment of fractures of the metacarpal and phalangeal bones it is not necessary to apply much force for reduction or to apply great tension to keep the fragments in place. The splints here described are designed to hold the digits in a position of rest with the opposing muscle-tendon systems at minimal tension. The technique, carried out usually under regional block anesthesia, begins with the splinting of the patient's forearm, wrist, and hand, after which both hands of the physician are free to reduce the fracture and place the fractured digit on its splint. The finger and thumb splints, being made of aluminum, are readily cut and bent and facilitate x-ray studies because they are radiolucent.

immobilization of the entire ray which contains the injured bone—digit, metacarpal, wrist, and forearm—to prevent distortion by the muscle-tendon systems; (4) compression throughout the injured area to avoid edema with its ensuing fibrosis; and (5) closed method of reduction and immobilization if possible. A splint and the tech-

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Read before the Section on Orthopedic Surgery at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

niques of its uses, to be described, seem to meet these requirements and may be applied in most cases by a physician working alone.

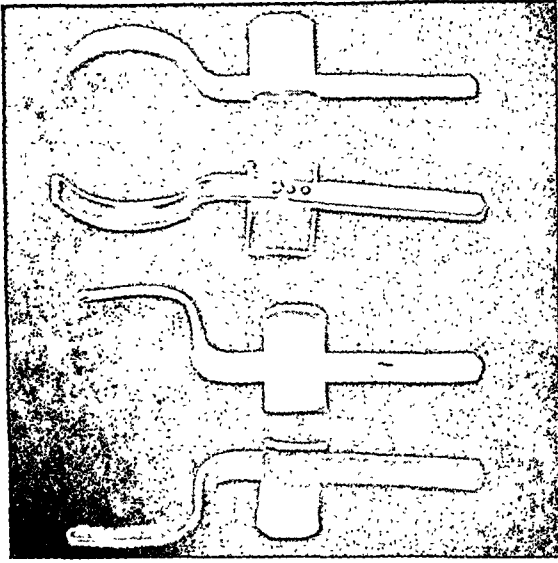


Fig. 1.—*Top*, two views of finger splint. *Bottom*, left and right thumb splints.

Position of Rest

When the muscle-tendon systems are at maximal relaxation, the counter tensions of external devices need not be great to resist them nor is it necessary to apply strength in the reduction of the fractures. The best way in which to show this "position of rest" is to hang the completely relaxed hand in a container of water. The water counteracts the pull of gravity. Most of the fractures will be treated by placement of their rays in this position.

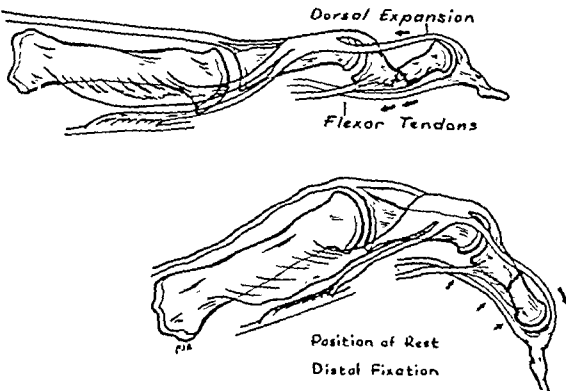


Fig. 2.—*Top*, typical displacement of fragments in fractures of middle phalanx (unless disturbed by external force of trauma). *Bottom*, reduction and immobilization by "cock-up" position and distal fixation on finger splint.

Figure 1 shows two views of the finger splint and the left and right thumb splint used to hold any digit in this position of rest. Note that whereas the finger splint can pivot to any of the four fingers, the thumb splint is made for either right or left

thumb. The finger splint is used for all fractures of the middle and proximal phalanges and for fractures of the shaft and base of the second through fifth metacarpals. The thumb splint is used for fractures of the proximal phalanx of the thumb and of the first metacarpal. The principle of both splints is to hold the forearm, wrist, hand, and digit in a position of rest where the muscle-tendon systems exert least tension. The digit is held by the distal fixation of tape. There is no variable spring or rubber tension. It is a closed method and, hence, does not open routes of infection.

Figure 2 (*top*) illustrates the mechanism of angulation and shortening of fractures of the middle phalanx. Note that once the fragments have been

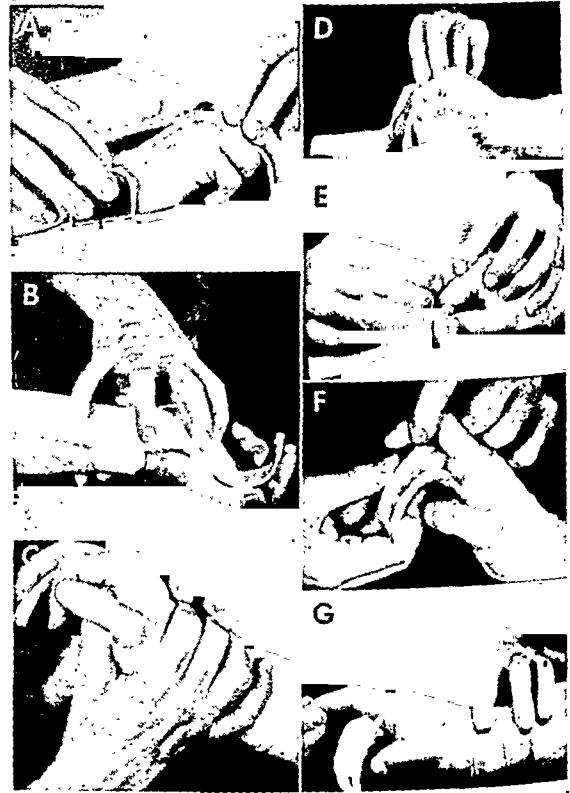


Fig. 3.—A, splint fitted to injured ray by bending distal part and wrist cuff. B, volar plaster slabs fitted as cock-up splint to hold metacarpal arch. Distal edge is cut on bias to fit proximal flexion crease. C, padded plaster (wet) applied to hand and forearm, wrapped with gauze, and held in proper position until set. D, split, 1-in. tape applied to digit of injured ray after painting with tincture of benzoin. E, fracture (proximal phalanx here) gently reduced. F, position maintained by pressing end of tape to under surface of splint. G, strips of elastic adhesive applied about finger and splint and elastic bandage or circular plaster to forearm and hand.

angulated the muscle-tendon systems that have their insertions beyond the site all shorten to increase the distortion. This phenomenon is responsible for the distortion of most fracture fragments. The bottom illustration in figure 2 shows the mechanism of its reduction and immobilization.

Application of the Splint

Anesthesia, usually by regional block, is first initiated. Figure 3 shows the application of the splint. The method is quite the opposite of orthodox techniques. Instead of first reducing the fracture and then attempting to splint it, here the forearm, wrist, and hand are first splinted. Both hands of the physician are then free to reduce the fracture and place the digit on the splint.

The aluminum splint is applied to the hand and forearm and easily bent to fit the injured digit. Excess metal over $\frac{1}{2}$ in. beyond the tip of the digit is cut off (fig. 3A).

The splint is fixed to the wrist, hand, and forearm by laying a padded volar cock-up splint of plaster from the proximal transverse flexion crease of the palm to the proximal end of the forearm part of the splint (fig. 3B). These are held in position with a wrapping of 2-in. roller gauze. The patient's hand is carefully held in the operator's two hands while the plaster sets, in order to maintain the gentle arch of the metacarpals (fig. 3C). When the plaster is dry and the hand, wrist, and forearm are firmly immobilized, the physician may begin the reduction with both hands free to work.

First the digit is painted with tincture of benzoin (fig. 3D). When this is dry, a split piece of 1-in. tape is applied to the dorsum of the finger, extending only to the fracture site. If there is an open lesion at the site of the fracture, it is first cleansed and sutured.

The early reduction of fractures in the hand requires no great strength (fig. 3E). The patient's hand is grasped with one hand, and the digit distal

The digit is then laid on the splint and fixed in position by pressing the tape to the underside of the splint (fig. 3F). The index finger is held up out of the way in this photograph to show the injured

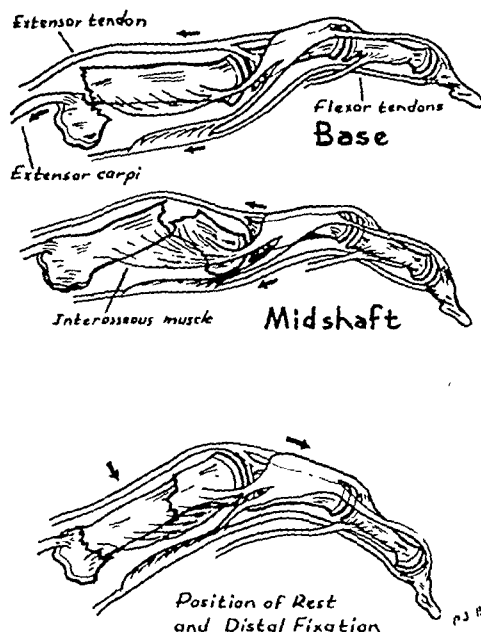


Fig. 5.—Top, displacement of fractures of base and shaft of metacarpals of fingers. Bottom, reduction on finger splint.

finger on the splint. An x-ray is now taken. This is easily done because the splint is radiolucent. If the position of the fragments is acceptable, strips of elastic adhesive— $\frac{1}{2}$ by $2\frac{1}{2}$ in.—are placed about the digit and splint to further immobilize the digit, to prevent edema, and to keep the tape in place (fig. 3G). An elastic bandage is then applied about the hand and wrist. If the patient is apt to give the injured member hard usage, a light circular cast may be used in place of the elastic bandage. No plaster is ever used or needed on the digit. The plaster cock-up splint is used with all applications of the finger and thumb splints.

Figure 4 shows the mechanism of fracture, displacement, reduction, and immobilization of the proximal phalanx. Note the angulating effect of the intrinsic muscles and the worsening of the displacement by all the long tendons. Reduction is maintained on the splint. Distal fixation does not mean distal traction. The digit is simply held by the tape without the distracting traction that may result in nonunion.

Fractures of the shaft and base of the metacarpals (fig. 5) are distorted by the long tendons but held in proper alignment by placement of the hand in a position of rest, reduction, and fixation of the digit distally on the finger splint.

Fractures of the proximal phalanx of the thumb (fig. 6) are treated by the same technique as for

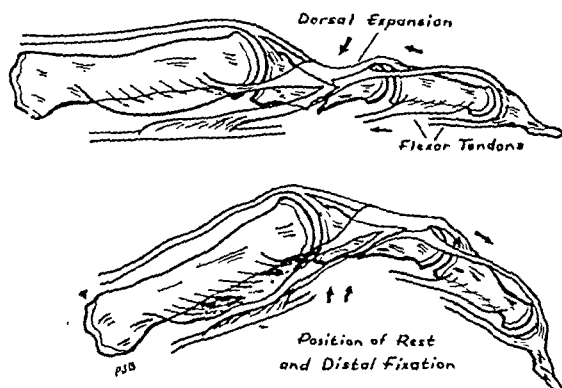


Fig. 4.—Top, fracture of the proximal phalanx of finger with its typical displacement. Bottom, reduction by cock-up of wrist, position of rest, and distal traction.

to the fracture is grasped with the fingers of the other hand. Gentle traction, with sometimes the counterpressure of the operator's thumb or index finger as indicated by the circumstances, results in a smooth reduction.

those of the proximal phalanges of the fingers, in that the thumb splint is applied and held with plaster and gauze and then the fracture is reduced and fixed with tape and elastic adhesive.

Volar displacement of the head of the second and fourth metacarpals occurs with fracture through the neck. The treatment of this type of fracture appears to require the replacement of the head by pressure on the flexed proximal phalanx. The finger splint (fig. 7) is simply bent in the direction shown and placed upon the dorsum of the hand. The usual volar plaster cock-up splint is slipped into the palm inside the flexed finger and held with gauze while the finger is held by a simple strip of tape about the middle phalanx. Care must be exercised to obtain an exact fit, or else pressure sores may appear.

Dressing of Wounds

There were four bullet wounds that comminuted the phalanges in a series of 32 fractures treated by the splints. The wounds were cleansed with soap and water. After sharp débridement, the skin disruptions were closed. After closure of the skin,

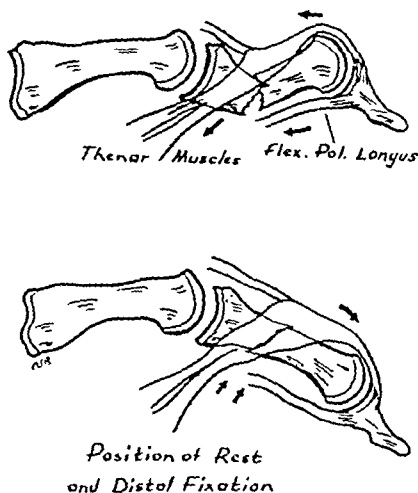


Fig. 6.—Reduction of fracture of proximal phalanx of thumb.

reduction was accomplished in the above-described manner and the finger immobilized on the splint. Motion was excellent after healing. The tape was applied only on the intact skin.

In order to dress open wounds, the bandage is cut off and the splint depressed to dress both dorsal and volar wounds of a digit. If the digit is not force-



Fig. 7.—Immobilization of fractures of neck of second through fourth metacarpals with finger splint bent and applied to dorsum. Plaster cock-up splint and elastic bandage are used in all applications.

fully manipulated during the dressing change, it will remain in this position of rest without change. The distal splint is simply bent back up in place after the clean dressing has been applied. The finger is reapplied to the splint as before.

It is well to note that, whereas a straight-edged plaster volar cock-up splint is used with the aluminum splint for fractures of the phalanges and the second through fourth metacarpals, a lateral (radial) extension (or lip) of plaster is needed to go over the dorsum of the first metacarpal when this bone is fractured to hold it firmly against the splint.

Summary

Aluminum finger and thumb splints have been combined with a volar "cock-up" plaster cast for the treatment of fractured phalanges and metacarpals. The technique differs from the orthodox in that the fractured bone is reduced and splinted only after the forearm, wrist, and hand have been immobilized. It is a closed method which is applicable to simple fractures and appears to be the only method by which markedly comminuted fractures may be immobilized. The fractured bone is under complete control during reduction and healing. Edema is avoided by directly applied compression. X-ray studies are easily performed through the radiolucent splints. Most fractures in the hand can be reduced by a single physician using this technique.

508 E. South Temple St. (2).

The finger splint used in this study was supplied by the Richards Manufacturing Company, Memphis, Tenn.

ISOTOPE CIRCULATION STUDIES IN CONGENITAL HEART DISEASE

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and

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The great forward strides in the field of intracardiac surgery made in the past decade have placed an increasing burden on those responsible for the diagnosis of various congenital defects. Whereas just a few years ago the diagnosis of "congenital heart disease" was sufficient, in the vast majority of instances, to preclude direct operative repair, today such a diagnosis is of little or no value. The exact site of the defect and its hemodynamic behavior must be determined with accuracy so that the feasibility of correction can be ascertained. Surgical approaches and bypass techniques will vary greatly with location of the lesion, so that accurate preoperative diagnosis is of prime importance.

Intracardiac and extracardiac left to right shunts usually can be detected by use of the cardiac catheter and determination of oxygen content of blood samples withdrawn from the various chambers and vessels. Areas of obstruction or stenosis are located by pressure variations. Right to left shunts are, however, considerably more difficult to pinpoint. The catheter is directly useful only in the rare case in which it happens to pass through the defect. Angiocardiography, with injection being made either into a vein in the arm or directly into the chambers at the time of catheterization, yields considerably more accurate results. However, this procedure has two main drawbacks: a small shunt may be missed because an insufficient amount of dye passes through it, or dilution of the dye will be so rapid that the small jet is missed; and the procedure is technically difficult. In addition, although hazards have been reduced by use of newer contrast mediums, there is still some inherent danger in injecting large amounts of iodinated contrast material.

Dye dilution, which has proved very successful when performed by those with experience and competence, is at best a rather cumbersome procedure. For the most accurate results, arterial puncture is necessary. Although this can be accomplished with relative ease in the adult, the placing of an indwelling arterial catheter in the infant or young child is a fairly difficult procedure that may well upset the physiological state of the patient. Although oximetric measurements in the ear obviate the need for arterial puncture, they have been reported as considerably less accurate than values obtained by arterial sampling, particularly in infants and young children.¹

In the diagnosis of congenital cardiac defects, right to left shunts may be more difficult to detect and accurately localize than left to right shunts. A new procedure developed for detecting shunts consists of injecting a substance (I^{131} -labeled sodium and methylglucamine diatrizoate) which serves as a rapidly excreted radioactive tracer. The injection is made into the various chambers of the heart by way of a catheter inserted through a vein, but injection by direct venipuncture also gives useful results. Three radiation counters are placed over the heart, over a peripheral lung field, and over a femoral artery, and the time of appearance of increased radioactivity at these three places is found to give information that cannot be obtained from electrocardiograms, pressure recordings, and angiocardiograms alone. The procedure demonstrated its usefulness in 42 patients suspected of having right to left shunts. A variety of other conditions can also be investigated by this means, and a marked delay (up to 20 seconds, as compared with a normal of 5 seconds) in the appearance of radioactivity in the femoral artery and leg was among the features noted in 17 patients with disease of the mitral valve. The apparatus needed in this procedure can be reduced to a compact, portable unit, and the method has obviated the need of puncturing the femoral artery in the detection of intracardiac and extracardiac shunts.

A new procedure, therefore, has been developed for the detection of shunts, consisting of the injection of trace amounts of a radioisotope into the various cardiac chambers and the vessels and the recording of appearance times and concentration slopes by means of externally placed, collimated scintillation counters.²

This method obviates the need for arterial puncture. Recordings are made from counters over the precordium and from over an extremity. A third counter can be used as desired, either over the lung or over another peripheral vessel. This study is very simple to perform and can be done ade-

From the Department of Radiology, University of Minnesota.

Read before the Section on Radiology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

quately by a trained technician. Direct recording allows immediate interpretation of tracings. Exact timing of the injection is unnecessary, since the counter placed over the precordium detects the appearance of the radioactive material at the heart and timing is from heart to peripheral artery, rather than from arm, or catheter end, as with dye dilution.

of stable sodium and methylglucamine diatrizoate in order to increase its specific gravity. It is then layered in a syringe in front of 5 cc. of saline solution and rapidly injected into the catheter when the study is performed.

Initially, radioiodinated human serum albumin was the injected material. However, we thought it

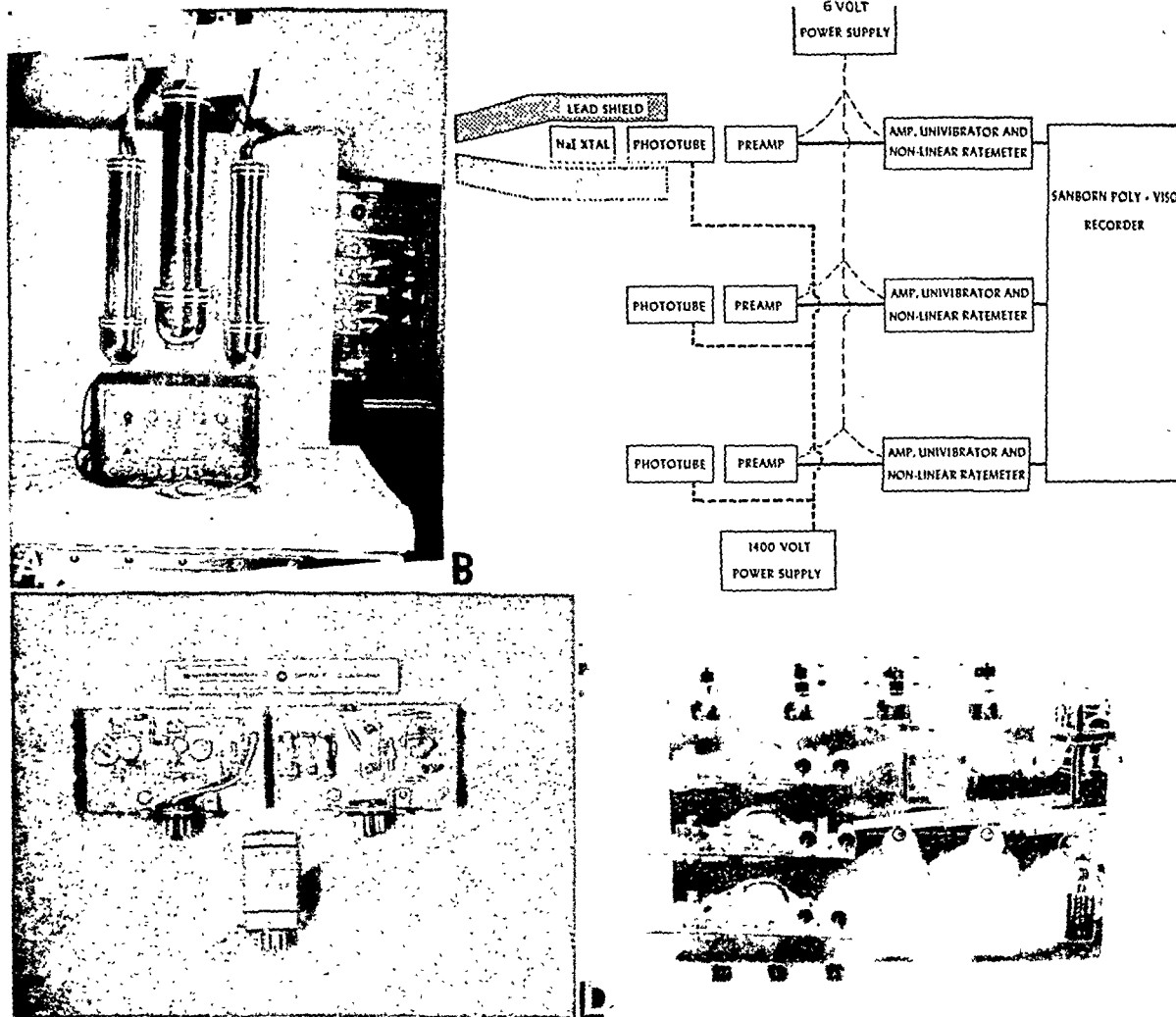


Fig. 1.—Recording apparatus for detection of shunts. A, shielded counters and rate meters. B, diagram of multichannel radioisotope detector and recording unit. C, high-voltage power supply and transistorized plug-in rate meters. D, low-voltage and high-voltage supply with rate meters and control unit.

Methods

Radioactive iodine (I^{131})-labeled sodium and methylglucamine diatrizoate (Renografin) is used for these studies. It is supplied in sterile form, with activity of 300 to 400 μ c per cubic centimeter. Approximately one μ c per kilogram of body weight is used for the initial injection (50 μ c for the average adult). Second and third injections require doubling and tripling the initial dose to produce enough counts above body background for accurate detection. The radioactive material is premixed with a small volume

essential to reduce radioactivity to the patient to a minimum. For this reason, the I^{131} -labeled sodium and methylglucamine diatrizoate was substituted for the iodinated albumin. This rapidly excreted urographic contrast material has a half-life of well under five hours in the patient with normal kidneys, as compared to three days for iodinated albumin.

Collimated, shielded scintillation counters are suspended by cables from a metal frame which travels in the supporting track for the image inten-

sifier used during the catheterization. A spring suspension, set for 27 lb., permits each counter to be individually adjusted to the height desired. These detectors include 1-by-1-in. thallium-activated sodium iodide crystals and are shielded by a minimum

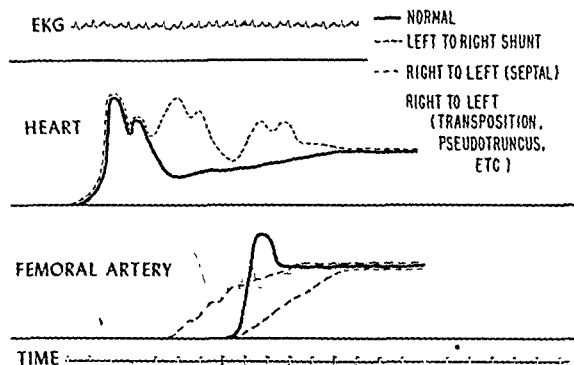


Fig. 2.—General patterns observed in isotope circulation studies.

of 1 in. of lead (fig. 1). Just prior to the injection, the counters are rolled into position and are held over the precordium and the femoral artery. A third counter has been utilized over the lung in a series of patients.

The great majority of our studies have been accomplished at the time of catheterization, with injection being made through the cardiac catheter. However, injection by direct venipuncture has been done with good results in adults as a screening method for the detection of shunts. A large-bore needle (no. 18) is necessary in order to get a good bolus of radioactive material, and the placing of such a needle is, of course, not practical in infants and young children.

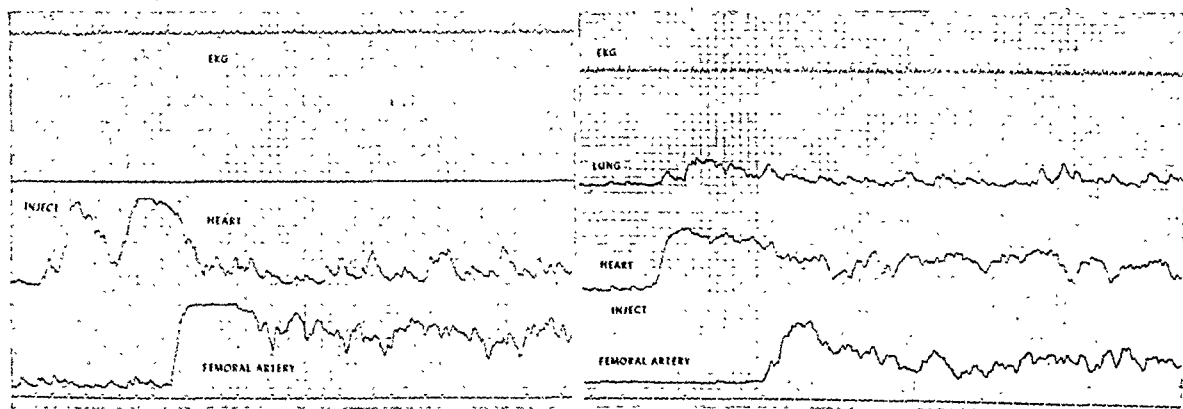


Fig. 3.—Normal tracings. *Left*, injection into right atrium. *Right*, injection into antecubital vein with third counter over lung.

Special instrumentation has been developed for these studies. Since information must be collected over relatively short times, rate meters with short time constants ($\frac{1}{2}$ to 1 second) are essential. Figure 1 (B) shows a schematic representation of the entire unit. Counters are supplied from a hermetically

sealed, transistor, high-voltage unit (1,500-volt regulated), as illustrated in figure 1 (C). The amplifier, multivibrator, and rate meter circuits are fully transistorized and are a single plug in the unit. The rate meters were designed to connect directly to the four-channel Sanborn Polyviso recorder. Figure 1 (D) shows the low-voltage power unit and three rate meters assembled in the control unit. The preamplifiers are mounted with the photomultiplier tubes in the shielded section of the counters.

Linear circuits were utilized initially. However, this type of integration was found unsuitable for congenital heart studies, since the counting rates could not be accurately predicted. The short duration of the entire procedure precludes sensitivity adjustments during the study, so all controls must be preset. The circuits finally adopted provide non-linear recordings closely approximating a logarithmic two-octave scale.

In cases in which more than one injection is being made, recording of residual radioactivity in the body is suppressed by changing the time constant of the storage circuit, and a switch is provided for this on the control panel. The entire circuit, as finally developed, is a small, light-weight, and compact unit.

Results

When injection is made through the cardiac catheter, the precordial counter records an immediate sharp rise in activity. If a peripheral vein is injected, the rise will be delayed a few seconds. One to two heartbeats later the material is detected by the counter held over the peripheral lung field. If the cardiac (precordial) counter is sharply collimated, a slight decrease in activity will be observed while

the isotope is in the lungs. This is followed by another increase in activity and then a decline to equilibrium.

In the normal person, (fig. 2 and 3) the collimated counter over the femoral artery then records a precipitous rise, followed by a slight decrease in activ-

ity before equilibrium is reached. Heart to femoral artery time varies between 5 and 12 seconds and depends partly on cardiac rate. We have found heart to femoral artery intervals of between 9 and 18 heartbeats in normal persons. If a proper injection is made, all normal persons will exhibit a sharp rise in radioactivity over the femoral artery. We attach no significance to the down slope of the femoral artery curves, since the counter placed over the upper leg is recording radioactivity from the veins and capillaries as well as from the artery.

Right to left shunts are characterized by a short interval between appearance of the radioactive material at the heart and its appearance at the femoral artery, as the isotope containing desaturated blood is shunted into the systemic circulation (fig. 2). Two general groups have been

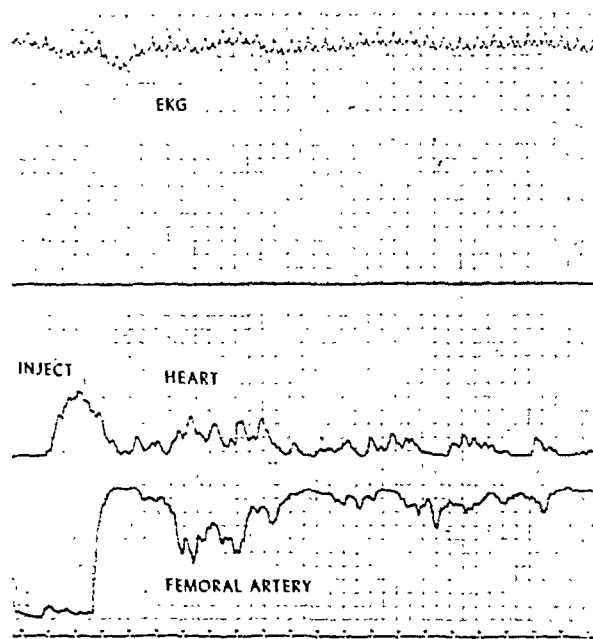


Fig. 4.—Tracing of patient with tetralogy of Fallot with marked desaturation. Note two-second heart to femoral artery interval.

observed: Grossly cyanotic patients, in whom a considerable portion of the systemic cardiac output consists of desaturated blood, exhibit the early appearance of a large bolus of radioactivity at the femoral artery and a short stay of the material at the heart. This pattern occurs in patients with transposition of the great vessels, cyanotic tetralogy of Fallot, and pseudotruncus (fig. 4). Patients with smaller right to left shunts, most frequently septal, show early appearance as in the grossly cyanotic group, but the amount of radioactivity appearing early is small and variable and a shallow slope of appearance is often seen over the femoral artery (fig. 2). These defects are frequently, although not necessarily, associated with left to right shunts.

Location of the right to left shunt is determined by making multiple injections into various chambers. The most distal chamber or vessel that, when injected, will produce early appearance of radioactivity at the femoral artery is the site of the right to left shunt. A cyanotic boy for whom previous cardiac catheterization and angiocardiology had failed to indicate a definite diagnosis was studied by this method. Injection was made into the right ventricle, and, 5 seconds later, radioactivity appeared at the femoral artery (normal time) (fig. 5A).

The catheter was withdrawn to the right atrium, and on reinjection a 2-second interval between the appearance of radioactivity at the heart and at the femoral artery was recorded (fig. 5B), clear evidence of a right to left shunt at the atrial level.

Typical patterns of the precordial records for the various anatomic malformations producing right to left shunts have not, as yet, been noted. It is possible that a few of the more common anomalies in this large group may exhibit constant precordial curves, but, as yet, this has not been observed.

Forty-two patients suspected of having right to left shunts were examined by this method. Two grossly cyanotic adults were studied with several injections. Both patients were considered clinically to have right to left shunts before the isotope studies were done. Heart to femoral artery time was greatly prolonged in each case, rather than diminished as one would expect with right to left shunt. On the basis of these studies a diagnosis of obstructive pulmonary vascular disease was made and was subsequently confirmed at autopsy. Five cases of trilogies of Fallot were diagnosed. Two of these patients had previous cardiac catheterization and angiocardiology which failed to yield the proper diagnosis. In all five cases there was a much shorter heart to femoral artery interval when the radioactive material was injected into the right atrium than when it was injected into the ventricle (fig. 5A and B).

In four instances right to left shunts were missed. Two of the tracings are technically unsatisfactory, in that a very poor record was obtained from the counter over the femoral artery. It is likely that the end of the counter was not over the artery but, rather, over the soft tissue to one side of the vessel. In one case there was too much background variation, and it is assumed that a small amount of radioactivity appearing early was masked by the background variations. In one instance we cannot explain the failure to detect a shunt.

In the remainder of the cases there was agreement between the isotope results and angiocardio-graphic, surgical, or postmortem findings.

Although the method was initially designed for the detection of right to left shunts, we have had the opportunity to study a variety of other condi-

tions. Patients with left to right shunts present a rather characteristic pattern. Initial appearance time at the femoral artery is the same as in normal persons, but the slope of the rise of radioactivity is much more gradual and the precordial and lung counters record continued high activity, due to recirculation (fig. 2 and 5 *c*). Location of the left to right shunt cannot be determined by this method, since recirculation will occur no matter where the injection is made.

Seventeen patients with mitral valve disease have also been examined. They all exhibit a similar pattern, although in varying degrees. Appearance time at the femoral artery is quite markedly de-

with a single counter placed over the heart and studied patterns in normal subjects and in patients with congenital heart disease. MacIntyre and co-workers⁴ devised a method necessitating arterial puncture. Mack and associates⁵ placed a scintillation counter over the heart, as did Zacks,⁶ who recorded patterns of appearance and disappearance from the heart. Thode and co-workers⁷ studied circulation dynamics by means of inhalation radiocardiography with use of radioactive methyl iodide.

As yet we have made no attempt to quantitate our studies, although standardization of sensitivity of the recording apparatus and of dose should allow more precise determinations of dynamics.

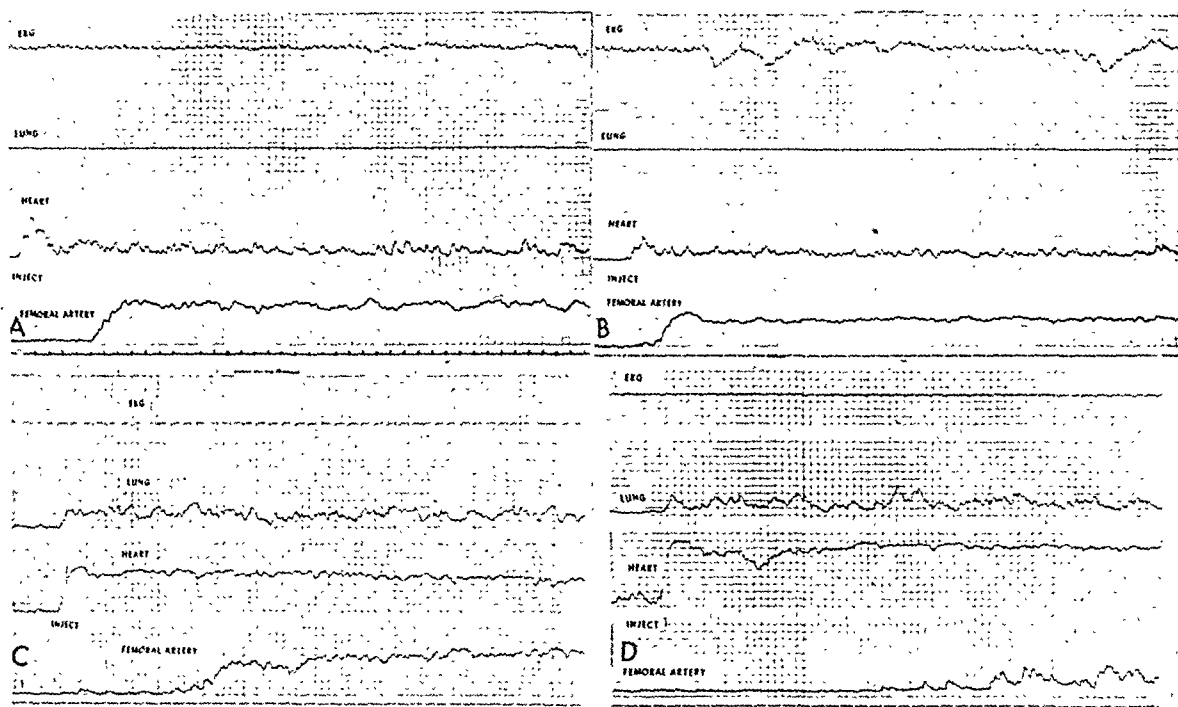


Fig. 5.—A, tracing of patient with trilogry of Fallot after right ventricular injection. Note normal heart to femoral artery interval. B, tracing of same patient after right atrial injection. Note two-second heart to femoral artery interval. C, tracing of patient with left to right shunt. Note gradual rise of femoral artery counts and sustained elevation of heart counts. D, tracing of patient with mitral stenosis, showing delay in appearance at femoral artery with slow rise in counts.

layed (up to 20 seconds), and a very gradual slope of increasing activity is observed by the leg counter (fig. 5D). Patients in cardiac decompensation and those with particularly large hearts also exhibit a gradual rise in femoral artery counts which resembles tracings from patients with left to right shunts and with mitral disease.

Comment

This method was developed in an effort to simplify the diagnosis of right to left shunts. It was not intended as a tool for detailed physiological studies. With use of externally placed counters, it is, however, possible to determine cardiac output. Goldring and associates³ used radiocardiography

Electronic circuitry had to be especially designed. Initial equipment was bulky, complex, and unreliable. The final result, however, is a small, compact, and portable unit which, because of the transistorized circuitry, is extremely reliable.

Summary

A new method for the detection of intracardiac and extracardiac shunts has obviated the need for femoral artery puncture. The method is simple and requires little time. Right to left shunts can be accurately detected and located. Typical patterns have been observed in left to right shunts and in mitral disease. The method has been used qualitatively but would appear to lend itself well to quantitative studies of circulation dynamics.

This study was supported, in part, by grants from the Graduate School, University of Minnesota, and the Squibb Institute for Medical Research, E. R. Squibb & Sons.

The radioactive iodine-labeled sodium and methylglucamine diatrizoate used in this study was supplied as Renografin by E. R. Squibb & Sons, New Brunswick, N. J.

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SUSPENSION CAST FOR ACROMIOCLAVICULAR SEPARATIONS AND CLAVICULAR FRACTURES

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We wish to present a new method for the conservative treatment of recent acromioclavicular dislocations. As this injury is easy to diagnose and the dislocation is usually easy to reduce, it should be easy to treat the injury and maintain the correction. This method uses the principle of gravity when the patient is upright and the principle of gentle pressure and counterpressure when the patient is lying in bed. The patient finds that clothes can be worn comfortably in the conventional manner during the entire five to six weeks of treatment. The patient is also allowed a satisfying use of the whole upper extremity after a few initial days in a sling until the pain disappears. It has been our experience that the surgeon is also gratified with the results.

Methods of Treating Acromioclavicular Separations

Many methods of treating acromioclavicular separations have been reported. The conservative ones are based on the anatomic principle of depression of the clavicle and elevation of the acromial process chiefly through the medium of both the elbow and shoulder joints. The principle of the famed Velpeau bandage is the best example. It

Treatment for acute acromioclavicular dislocations with use of a loose, suspension cast obviates many of the disadvantages common with the other methods. The method uses the principle of gravity when the patient is upright and the principle of gentle pressure and counterpressure when the patient is lying in bed. It is not necessary to immobilize the whole arm if the patient is intelligent and cooperative enough to tighten the shoulder straps on lying down. Clothes can be worn comfortably in the conventional manner during the entire five to six weeks of treatment.

has been modified sufficiently by numerous authors to be used with (1) adhesive strappings, (2) harnesses, straps, and braces, or (3) plaster of paris spicas or splints. Many excellent results have been obtained by the proper use of these methods. Urist¹ in his excellent paper says, "More than thirty-five conservative methods and twenty-eight operative methods have been advocated." The multiplicity of these methods seems to proclaim that a search for a better method still goes on.

From St. Luke's Hospital.
Read before the Section on Orthopedic Surgery at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

As previously mentioned, reduction of the dislocation is not difficult unless there is interposition of soft or hard tissue in the joint when open reduction seems indicated (Urist¹). The problems all arise in the method of immobilization. Watson-Jones² says of the Sayre strapping, "The fingers and hand are strapped flat against the chest wall, the finger joints become so stiff that they may never recover. Stiffness of the shoulder from peri-articular adhesion formation also occurs very early . . . in patients over the age of forty, there is only one real danger, the danger of stiff fingers and a stiff shoulder."

McLaughlin³ summarizes the problem of resulting limitation of motion in this way, "A superficial clinical philosophy predisposes to concentration of the therapeutic attention upon obvious local damage often at the expense of these equally important secondary matters. Many unsatisfactory results after shoulder injuries are the product of treatment."

Urist¹ aptly states of adhesive strappings, "Improved techniques . . . still do not obviate the necessary removal and reapplication of the dressings which are almost as unpleasant for the physician as for the patient."

Harnesses and braces are difficult to keep adjusted, and they are also difficult to keep comfortable. We have recently seen two temporary ulnar paralyses develop from the under elbow strap. It must be pointed out that a force more than sufficient to support the whole weight of the upper extremity is required in most of these methods. Irritation and even ulceration of skin is frequently encountered.

The plaster of paris splints and spicas are more comfortable and more foolproof, but their greatest disadvantage lies in the believed necessity of immobilizing the whole arm. We have not found this necessary if the patient is intelligent and cooperative enough to tighten the shoulder straps on lying down.

Use of the Suspension Cast

The method we will describe evolved from treating a patient wearing a Hunkin suspension spica cast (presented by Barnard⁴ in 1939 and reported by Wolin⁵ in 1944) who came under the care of one of us in an overseas general hospital in 1943. The arm of this patient was resting on the bivalved arm piece of the suspension shoulder spica. It was immediately noted that the acromioclavicular separation was well controlled and that the patient could lift his arm out of the arm piece without pain or slipping of the bone. The arm piece was cut away, and an excellent result was obtained with no residual arm and shoulder weakness or stiffness. We were pleased to find that Wolin modi-

fied the Hunkin cast in much the same manner. He used a long close-fitting jacket resting on the iliac crests. The main modification that we have found advisable is that of a loose-fitting hanging cast that really hangs. It is not snugly fitted to the thorax nor does it restrict the lumbar motion by extending down to the iliac crests.

As shown in figure 1, a loose-fitting jacket is applied smoothly, with appropriate padding, over the chest. It is best molded fairly close under the pectoral muscles on the affected side (fig. 2). It should extend just past the xiphoid process in front and can be lower behind. However, it should not be wide enough to rest on the iliac crests. It need not restrict any comfortable position of standing, sitting, or lying. On theoretical grounds, the weight of this cylindrical jacket need be only sufficient to overcome trapezius and sternomastoid (clavicular portion) muscle tone as well as skin friction. However, it need not be bulky or heavy.

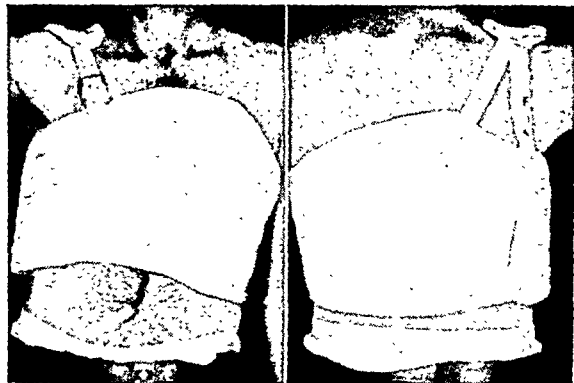


Fig. 1 (case 1).—Suspension cast for acromioclavicular separation.

While the plaster is being applied, at least two straps are incorporated within the cast (fig. 2, right). The strap ends emerge from the superior edge of the cast so that they meet in front, at a buckle where the patient can easily adjust the tension of the straps when lying down (fig. 2, left). The straps are so located that the two parts hang almost straight from the outer end of the clavicle. It is frequently advisable to put in another pair of straps and another buckle so that they may cross or spread out, thus allowing finer adjustments of pressure. This prevents the straps from slipping off the shoulder, or, in case of a fractured clavicle, permits added pressure to be applied over the proximal fragment where desired.

A piece of soft sponge is fashioned to fit under the straps. It is cupped to prevent point skin irritation, as shown in figure 2. This molding of the rubber pad also enables one to control the pressure direction as desired. For example, if there is a pos-

terior displacement of the clavicular end, the pad can be placed and adjusted so that the maximum pressure is exerted along the posterior edge of the clavicle instead of just along its superior surface

charged by a bull and was tossed into the corner of an enclosure when the bull's horns caught his overalls. On the second charge he was struck on his chest and shoulder. The patient then managed to scramble over the enclosure wall. On admission he was found to have (1) a complete

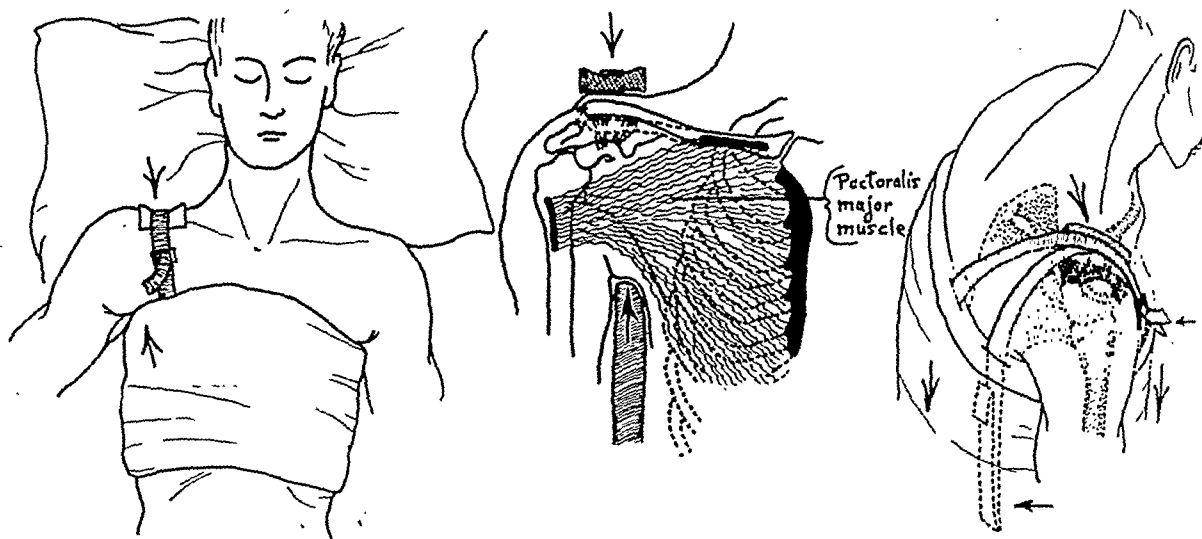


Fig. 2.—*Left*, patient in recumbent position tightens shoulder strap of suspension cast. *Center*, diagram showing correction of dislocation. Capsular, trapezoid, and conoid ligaments have been torn. Note dual position of cast—hanging weight and scapula and pectoral bucket support. Well-fitted cast tends to support scapular and shoulder girdle when shoulder strap is kept snug. Padded shoulder strap and weight of cast depress outer end of clavicle. *Right*, diagrammatic details of suspension cast. Note grooved foam-rubber shoulder pad, two webbed straps with single anterior buckle, and method of incorporating strap in plaster

(fig. 2, right). We have used this type of suspension cast on 5 Army and 18 civilian patients. These patients have been under our own supervision, and they all showed excellent early cosmetic and functional results. No late follow-up studies have been made.



Fig. 3 (case 1).—Roentgenograms showing complete acromioclavicular separation on the right (top) and slight residual thickening over right acromioclavicular joint (bottom).

Report of Cases

CASE 1.—A 37-year-old man (fig. 1), employed on a dairy farm, was admitted to the emergency room at Saint Luke's Hospital on Jan. 4, 1948. He stated that he had been

acromioclavicular separation on the right (fig. 3, top), (2) marked depression of the left anterior chest wall involving the costal cartilages of the third through sixth ribs and fracture of the left seventh rib, and (3) multiple laceration and contusions.

Adhesive strapping was first applied to the chest and shoulder. The patient continued to complain chiefly of chest pain, and on Jan. 7, 1948, a chest x-ray disclosed evidence of fluid in the lower left pleural space. On Jan. 8, 1948, a suspension cast was applied which seemed to relieve many of his chest symptoms as well as pain in the shoulder. He was discharged on the sixth hospital day, Jan. 10, 1948 and at his own request returned to light work on Feb. 1, 1948.

He was next seen on April 11, 1948, and had already returned to full-time regular work. He complained of occasional slight twinges of pain in the region of the right shoulder and some pain in the left side of the chest on maximum effort. There was slight residual, palpable thickening over the right acromioclavicular joint, but there was no hypermobility or visible deformity (fig. 3, bottom). Since that time, he has continued to work without disability.

We have used the suspension cast in only two children with fractured clavicles because they seem to tolerate the figure-of-eight dressings rather well and the complication of stiffening of the joints is practically nonexistent. However, adults do not tolerate these figure-of-eight dressings with comfort, and therefore the suspension cast has usually been used for adult patients. It is reported by Wolin⁵ to be of value in middle third fractures of the clavicle

with upward angulation of the fragments, and our experience bears this out. Two outer third clavicular fractures with much angulation were comfortably controlled with the suspension cast, with good alignment and functional results.

CASE 2.—A 30-year-old woman (fig. 4) sustained bilateral clavicular fractures and multiple rib fractures in an automobile accident. There was relief of pain in all of her fractures when a suspension cast was applied. The cast was applied on Nov. 1, 1948, and removed on Nov. 29, 1948. The patient obtained an excellent cosmetic result on both sides with mild, palpable callus on the left side (fig. 5). She returned to her work as stenographer five weeks after her injury.

Summary and Conclusions

There are difficulties and disadvantages in the common conservative methods of treating acute acromioclavicular dislocations. A method of treatment with use of a loose, suspension cast obviates many of the disadvantages common with the other methods. Excellent cosmetic and functional results have been obtained in 18 patients with acromio-



Fig. 4 (case 2).—Cast used in bilateral clavicular fracture.

clavicular separation and 5 with clavicular fractures. No patients with acromioclavicular separation needed further surgery or treatment. No clavicular fractures showed nonunion. All patients had a normal painless range of motion in the shoulders and elbows.

The important advantages of this method are as follows: 1. Full range of motion of the shoulder and elbow is allowed throughout the period of treatment. Resulting stiffness of these joints is therefore not encountered. 2. The patient is comfortable, and

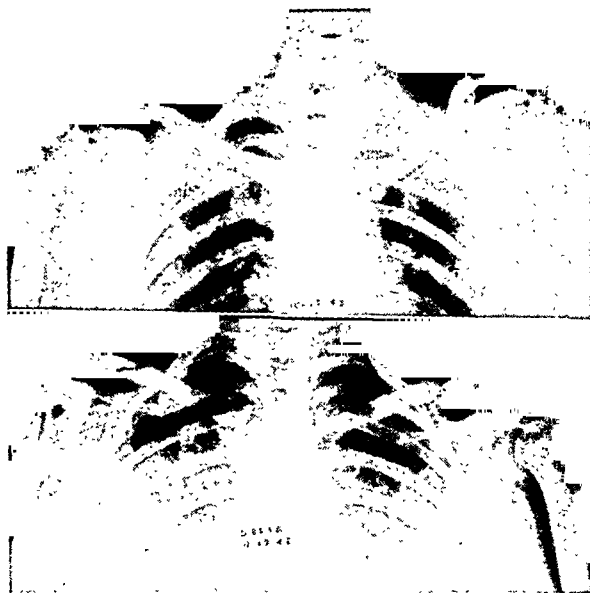


Fig. 5 (case 2).—Roentgenograms showing bilateral clavicular fracture (top) and condition five weeks later (bottom).

there is no residual skin irritation. 3. The cast is easily applied. 4. Conventional clothes can be comfortably worn by the patient.

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TREATMENT OF PERNICIOUS ANEMIA.—For maintenance treatment in pernicious anaemia a monthly intramuscular injection of 100 μ g of vitamin B₁₂ was entirely satisfactory. No advantage in a higher dose has been apparent. Over a period of two years a group of 71 patients taking a daily dose of 100 μ g by mouth an hour before breakfast were maintained at least as well as a group of 84 patients receiving a monthly intramuscular injection of 100 μ g. —E. H. Memsted, B.A., M. B. Cantab, D.C.P., and John Mills, M.D., *Vitamin B₁₂ in Pernicious Anaemia*, *The Lancet*, Dec. 20, 1958.

CEREBRAL ARTERIOGRAPHY—DIAGNOSTIC VALUE IN CEREBROVASCULAR DISEASE

Basdeo Balkissoon, M.D., John B. Johnson, M.D., Jesse B. Barber, M.D.

and

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The diagnostic value of cerebral arteriography in the evaluation of lesions of the brain appears not to have gained wide recognition in clinical medicine. Several factors may be responsible for the current limited use of cerebral arteriography. In many institutions the procedure continues to be complex, since it is performed as a major operation requiring an anesthetist and use of general anesthesia. In addition, contrast mediums previously used for cerebral arteriography have produced serious toxic brain reactions.¹

Our experience with cerebral arteriography has convinced us that this diagnostic technique may be invaluable in the clarification of a variety of lesions of the brain. During the past two years we have simplified our method of cerebral arteriography. The contrast medium we now employ appears to produce relatively few toxic brain reactions. The procedure is done with use of local infiltration anesthetization about the carotid artery at the intended site of needle insertion. The arterial needle used for cannulation is a standard arterial needle (Cournand, 18 gauge).

This communication is a report of our experience with diagnostic cerebral arteriography in patients with a variety of brain conditions. It indicates that cerebral arteriography can be simplified and made safer and that this is an important diagnostic tool easily available for use in a general hospital.

Materials and Methods

Renografin (sodium and methylglucamine diatrizoate), 60% (10 ml.), is used as the contrast medium. The patient is placed in the supine position and the neck hyperextended by a sandbag placed under the shoulders. The skin is prepared with antiseptic solutions. Procaine (Novocain) hydrochloride infiltration is done about the common carotid artery at about the level of the inferior border of the thyroid cartilage.

The Cournand arterial needle is introduced at a 45-degree angle with the skin. Blood is seen to spurt from the needle as soon as the arterial lumen has been entered. The needle, with or without its blunt stylet, is threaded carefully well into the

The value of the diagnostic information obtainable by cerebral arteriography in the past has been offset by the danger of complications. The procedure has now been made simpler and safer by the use of a 60% solution of sodium and methylglucamine diatrizoate as the contrast medium, 10 ml. being injected into the common carotid artery under local anesthesia. Roentgenograms of the cranium are made at one-second intervals for eight seconds after the injection. This procedure was carried out 80 times in 56 patients. Eight case-histories illustrate the importance of the data so obtained in discovering the cause and deciding on the treatment of obscure symptoms. The most impressive results were in patients with arteriovenous malformations. Undesired side-effects, ranging from transient paresis of one arm to transient hemiparesis lasting up to two days, occurred in 7 of the first 28 patients. No significant reactions occurred in the last 52 cases. The safety and simplicity of percutaneous cerebral arteriography performed under local anesthesia, as illustrated in this study, suggest a wider usefulness of this diagnostic method in the clarification of clinical problems involving cerebrovascular lesions.

artery and secured in this position. Whenever possible, the tip of the needle is guided from the common into the internal carotid artery. The stylet is left in place except during the injection.

A polyethylene connecting tube (6 in. long, with Luer Lock 3-mm. bore at one end and a two-way stopcock at the other) is used to connect the Cournand needle with the injecting syringe. This technique makes it possible to perform the procedure with more leisure and greater precision. The connecting tube is filled with Renografin, 60% (about 1 ml.), after which 10 ml. of this contrast material is rapidly injected into the carotid artery. Serial exposures of the skull are made at one-second intervals for eight seconds, with use of the Fairchild roll cassette or the Sanchez-Perez cassette changer. The arterial and venous phases of the cerebral

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blood vessels are obtained with this method of study. With two such injections, anterior and lateral exposures are made.

Results

Eighty injections were made in 56 patients. The right or left carotid artery was used primarily, in accordance with the neurological indications, with 38 done on the right and 42 on the left. In some instances the right and then the left carotid arteries were injected successively on the same day. There were 23 females, ranging in age from 16 to 66 years, and 33 males, ranging in age from 16 to 82 years. Six patients were more than 60 years of age. The variety of clinical cases used in this study can be seen in table 1.

Congenital Vascular Malformations.—Congenital vascular malformations apparently are not readily suspected in clinical practice. This lesion may re-

CASE 2.—A 33-year-old man had suffered with severe headaches all his life. On the night prior to this hospital admission he fell out of bed, and on awakening next morning he found his left side was paralyzed. His neck was stiff, and he had subarachnoid hemorrhage. Cerebral arteriogram demonstrated an arteriovenous malformation supplied by

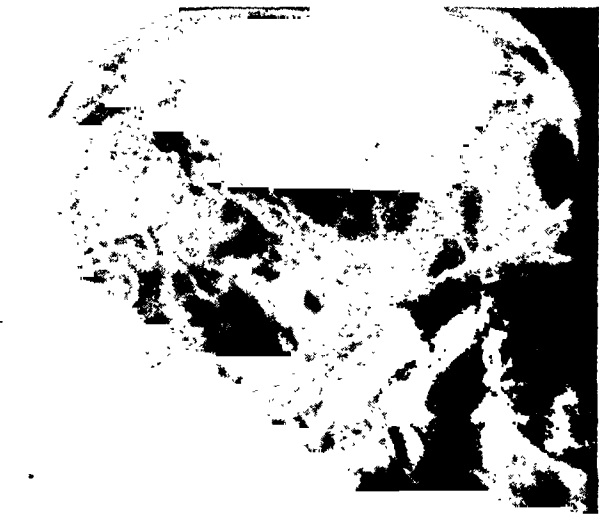


Fig. 1 (case 1).—Arteriogram showing arteriovenous malformation of brain with arterial feeders from anterior, middle, and posterior cerebral arteries.

the right anterior cerebral artery (fig. 2). With the patient under hypothermia 14 weeks after this hemorrhage, the arterial and venous components of the fistula were clamped with silver clips through a right frontal osteoplastic craniotomy.

In some cases the clinical picture may be complex, in that there may be a history of epileptic seizures of several years' duration and antecedent trauma. Case 3 is illustrative of this clinical course.



Fig. 2 (case 2).—Arteriogram showing arteriovenous malformation supplied by right anterior cerebral artery.

sult in a wide variety of clinical manifestations and may sometimes be misinterpreted as psychoneurosis. An illustration of this type of problem is presented in case 1.

CASE 1.—A 42-year-old woman had, since the age of 18, noticed a transitory flicker of light in her right visual field and had experienced unexplained episodes of transient cyanosis and blackout. She was admitted to Freedmen's Hospital four days after the sudden onset of repeated convulsions preceded by a peculiar numbness in her right foot and mid-thigh. Cerebral arteriography demonstrated an arteriovenous malformation in the left parietal region with arterial feeders from the anterior, middle, and posterior cerebral arteries (fig. 1). About three weeks after admission, with the patient under hypothermia the arterial and venous vessels of the anomaly were clamped off with silver clips and a small wedge of cerebral tissue excised through a left osteoplastic craniotomy.

The patient in case 2 presented a different clinical syndrome, consisting of severe recurring headaches, finally terminating in rupture and cerebrovascular accident.

CASE 3.—A 42-year-old man was knocked unconscious by a brick blow to the right parieto-occipital area of his skull 20 years prior to the present admission. For the past 18 years he had had Jacksonian-type convulsions, which were

TABLE 1:—Variety of Cases in Which Cerebral Arteriography Was Used

Clinical Diagnoses	No. of Cases	Confirmatory Pathology in Arteriogram, No.
Congenital cerebral aneurysm	7	5†
Congenital arteriovenous malformations	5	3
Cerebral thrombosis	9	1
Hypertensive cardiovascular disease with subarachnoid hemorrhage	4	0
Convulsions		
Grand mal seizures	4	0
Hypertensive encephalopathy	3	0
Jacksonian seizures	2	0
Subdural and intracerebral hematomas	7*	4
Migraine headaches	3	0
Brain tumor	7‡	1
Brain abscess	2	1
Neurofibromatosis	1	0
Cerebrospinal syphilis	1	0
Thromboangitis obliterans	1	0

* Five suspected subdural hematoma and three proved by arteriography; two suspected intracerebral hematomas and one proved by arteriography.
† Two suspected metastatic brain tumors.
‡ One early arteriosclerotic aneurysm of internal carotid artery.

usually preceded by involuntary palmar flexion of the left wrist and a shooting pain down the left arm. Cerebral arteriogram showed a large arteriovenous malformation in the right parietal area. The arterial feeders came principally from the middle and anterior cerebrals, and the draining veins emptied into the superior sagittal sinus (fig. 3). The patient refused operation and is now maintained on therapy with diphenylhydantoin (Dilantin) sodium and phenobarbital.

Subdural Hematoma.—Subdural hematoma not infrequently becomes a diagnostic problem to clinicians in general and at times even to the neurosurgeon. In some cases the patient who suddenly develops a cerebrovascular accident may fall and strike his head and may have a subdural hematoma superimposed on his basic disease. In patients presenting a questionable clinical picture, trephination of the skull is generally resorted to: Our experience with cerebral arteriography indicates that the procedure may be a simple and accurate diagnostic aid in suspected subdural hematoma.

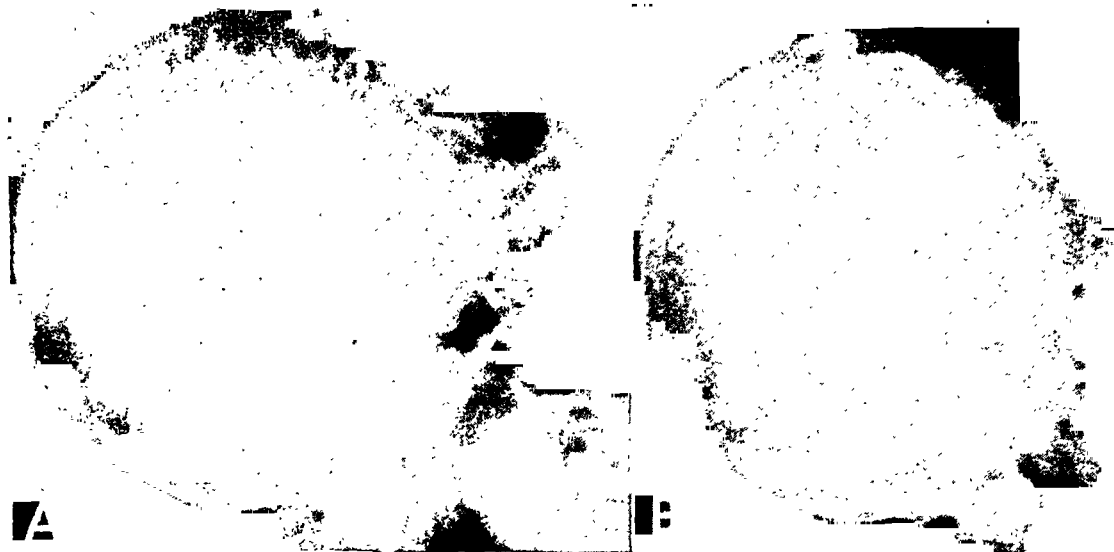


Fig. 3 (case 3).—Arteriograms showing arteriovenous malformation with, A, arterial phase supplied principally by middle and anterior cerebral arteries and, B, venous phase with superficial veins emptying into superior sagittal sinus.

CASE 4.—A 63-year-old man was admitted with a working diagnosis of cerebral thrombosis. Three months previously he had fallen and had struck his head. He was disoriented and had motor aphasia and hemiparesis of the right side. He was treated for two weeks for cerebral thrombosis with progression of his symptoms. Left cerebral arteriography done at this time showed compression of the anterior and middle cerebral arteries and evidence of a space-occupying lesion between the skull and the underlying brain (fig. 4). Anterior and posterior skull trephination on the left side and osteoplastic craniotomy were done, with the removal of a massive subdural hematoma. The patient died 48 hours after operation. We believe that the long delay between the injury and the diagnosis played a major role in the fatality.

It is well known that in some cases subdural hematoma may be mistaken for psychiatric disorders. This is illustrated in case 5.

CASE 5.—A 35-year-old man was admitted to our neuropsychiatric service with a tentative diagnosis of mental deficiency. He complained of frontal and occipital headaches and neck pains of four days' duration. Although he could answer questions rationally, frequently he would sit and stare into space and was depressed and tearful. Examination showed diplopia, slurring of speech, left papilledema, and blurring of the right disk. The history indicated that approximately two months before he had fallen at home and had struck his head on the radiator. Cerebral arteriogram of the left side done 20 days after admission showed a circumscribed mass which pushed the underlying brain and its blood vessels away from the calvaria and the anterior cerebral artery to the right of the midline. This was interpreted as representing either a subdural or an epidural hematoma (fig. 5). Skull trephination on the left side revealed solid and liquid clots and a membrane in the subdural region. An osteoplastic craniotomy was performed and the clots and membrane evacuated successfully.

Brain Tumors.—Space-occupying neoplasms represent a continuing problem in diagnosis. By far the two most reliable diagnostic methods in general use are ventriculography and cerebral arteriography. With the use of ventriculography there

may occasionally arise necessity for performing operation immediately after the procedure. Cerebral arteriography has the advantage that operation is rarely mandatory immediately after the procedure.

Our experience with cerebral arteriography in patients with brain tumors has been limited. Seven patients with clinically diagnosed primary or metastatic brain tumors have been studied by this method. One patient with a suspected space-occupying lesion of the right frontal area showed negative results by arteriography but revealed a porencephalous cyst by ventriculography.

In only one of these patients (case 6) were there strongly suggestive findings on arteriography. Ventriculography in this patient showed displacement

of the ventricular system to the left. Figure 6A shows the anterior-posterior arteriogram. There is outward and downward displacement of the right middle cerebral artery. The contrast is especially apparent when this arteriogram is compared with that of her opposite side (fig. 6B). Also seen was a basket of vessels in the thalamic region, upward displacement of vena cerebri magna, and downward displacement of the vena basalis.

CASE 6.—A 42-year-old woman was admitted to Freedmen's Hospital in a semicomatose state. She had four generalized convulsions on the day of admission and later developed bilateral papilledema. Through a right osteoplastic craniotomy, needling of the region of the thalamus revealed an area of increased density. A biopsy was performed. The tumor was deemed to be too deeply located for resection, and the bone flap was not replaced because irradiation of the tumor was planned. She died 15 months after operation.

Cerebral Aneurysms.—The most common pathological lesion we have demonstrated by cerebral arteriogram is that of intracranial aneurysm. Five cases have been demonstrated by arteriography in the past two years. Figure 7 illustrates a typical example (case 7). This is a saccular aneurysm located in the infraclinoid portion of the internal carotid.



Fig. 4 (case 4).—Arteriogram showing subdural hematoma with compression of anterior and middle cerebral arteries.

CASE 7.—A 57-year-old man had convulsions, and semiconsciousness was followed by headaches and a stiff neck. He was noted to have ptosis of his right eyelid, increased prominence of the right globe, ophthalmoplegia, and subarachnoid hemorrhage. Right carotid compression was progressively increased until this could be tolerated for 15 minutes. The right internal carotid artery was ligated at this stage.

Cerebral Thrombosis.—The value of cerebral arteriography in cerebral thrombosis is open to question, for in most patients with this condition no pathology is demonstrable by cerebral arteriography. In patients in whom there was a demonstrable thrombus, localization of the point of occlusion was of little value, since no therapy in



Fig. 5 (case 5).—Arteriogram showing subdural hematoma pushing underlying brain and blood vessels away from calvaria and anterior cerebral artery to right of midline.

the past seemed to have been of much value. However, with the recent use of fibrinolysin² in this disease, the localization of the point of occlusion may be indicated to evaluate the results of therapy.

CASE 8.—A 29-year-old woman was admitted to Freedmen's Hospital because of semiconsciousness. She had hypertension, hemiplegia of the right side, and hemisensory loss on the right. Cerebral arteriography performed on the left side two weeks after admission showed occlusion of the left middle cerebral artery just beyond its point of origin. There was also narrowing of the internal and external carotid arteries (fig. 8). Ventriculography showed dilatation of the left lateral ventricle suggestive of brain atrophy. Physiotherapy was started. At the time of discharge seven weeks after admission, she had return of sensation on the right and ability to move the right side of her face.

Toxic Reactions

With the first 28 cerebral arteriograms, the incidence of minor reactions was high. This was in contrast to a considerable experience with Re-

nografin in thoracic aortography.³ A review of our procedure showed that intracarotid injection of saline solution was the part of the procedure which came under question: Patency of the arterial needle was maintained by continuous injection of isotonic sodium chloride solution or 5% glucose in water. During these initial studies, saline solution was

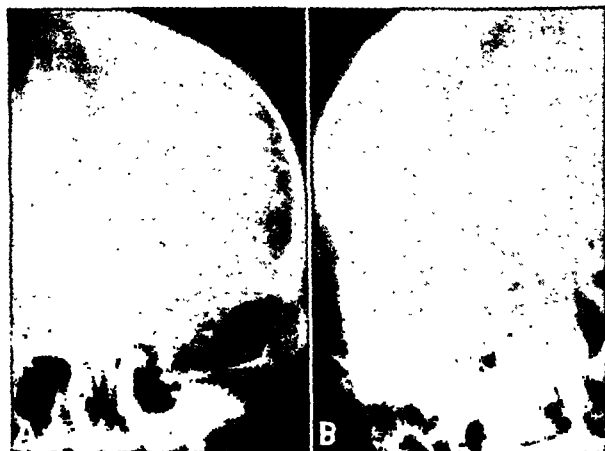


Fig. 6 (case 6).—Arteriograms showing brain tumor in region of right thalamus: A, outward and downward displacement of right middle cerebral artery with anterior cerebral pushed downward; B, contrasting anteroposterior arteriogram of left side with normal left anterior and middle cerebral arteries.

also used to dilute 76% Renografin to 60%. In addition, we were using volumes varying from 10 to 15 ml. of Renografin for the injection dose.

We have subsequently modified the procedure to eliminate injection of saline solution into the carotid artery, and the stylet is inserted into the Courmand needle when the needle is not in use. We limit the injection dose to 10 ml. for each series of exposures, and only undiluted 60% Renografin is now used. Since the introduction of these modifications, reactions are uncommon and of minor degree.

In the performance of the first 28 arteriograms, there were seven reactions, ranging from transient paresis of one arm to transient hemiparesis lasting from two hours to two days. These were in five men and two women, whose ages ranged from 39 to 63 years. In four cases the Renografin mixture was diluted. The dosage, number of injections, dilutions, and reactions are listed in table 2.

All of the patients except one suffered reactions when injection was made into the left common carotid or the artery supplying the dominant hemisphere. These reactions usually responded to stellate ganglion blocks or the intravenous administration of 0.1% solution of procaine. If there was delay in therapy the reactions lasted approximately two days, but if therapy was started immediately the reactions disappeared when the procaine infusion was completed, or in approximately one to two hours.

Comment

There is a great need in clinical medicine for simplified cerebral arteriography. By use of adequate procaine infiltration around the carotid artery and the percutaneous introduction of the needle the procedure becomes a minor one, requiring neither a surgical operating room nor an anesthesiologist. The Courmand needle simplifies the arterial punctures. The hub of the needle permits easy grasp. When the needle is taped to the skin, dislodgment practically never occurs. The connecting polyethylene tube avoids exertion of pressure on the Courmand needle during the injection. The stylet of the needle, inserted when the needle is not in use, avoids clogging of the lumen by clots.

Newer opaque mediums, such as Renografin which produce few or no toxic reactions in their use in cerebral arteriography, make the procedure safe. This is a definite improvement over most of the other contrast mediums used in former years. In our series of 80 cerebral arteriograms, reactions were encountered seven times, an over-all incidence of approximately 9%. With improvement in our technique after the completion of 28 arteriograms we encountered no significant reactions with the subsequent 52 cerebral arteriograms.

The visualization of the cerebral vasculature is excellent, as demonstrated in the cases presented. We feel that the 60% concentration of Renografin is superior to less concentrated solutions, and it is safe in this concentration.

The value of cerebral arteriography is well demonstrated in the cases presented. The most impressive results were in patients with arteriovenous malformations. The clinical picture of psychoneurosis, grand mal seizures, recurrent headaches, and Jacksonian seizures associated with trauma found in our patients is not widely recognized. However, the presenting symptoms and signs of

TABLE 2.—Reactions to Cerebral Arteriography

Case No.	Injection Dose, ml.	Concentration of Dye, %	Injections, No.	Reactions
9	10	60-76*	3	Transient facial paresis on right
10	15	47-60†	4	Transient facial paresis on right
11	15	60-76†	3	Transient hemiplegia on right and disorientation
12	15	60	3	Paresis of right arm
13	15	60	3	Transient hemiparesis on right and difficulty in speech
14	10	60	2	Transient hemiparesis on right
15	13	45-76†	21	Transient paralysis of left arm

* Diluted with isotonic sodium chloride solution.

† Diluted with 5% glucose in water.

‡ With this exception, all injections were into left carotid artery.

arteriovenous malformations in the advanced stage are well documented.⁵ Bruit is listed as a frequent physical finding.^{5a} We did not find this in our patients. We believe that cerebral arteriography should be performed more frequently in patients with convulsions, for when this is done the diagnosis of correctable brain lesions will more frequently be made.

In cases of subdural hematoma we obtained considerable help from cerebral arteriography. The patient in case 4 was being treated for cerebral thrombosis. A diagnosis of subdural hematoma was firmly established only after the cerebral arteriogram was performed. Another patient with a circumscribed chronic subdural hematoma was admitted with a diagnosis of psychosis, but cerebral arteriography confirmed the suspicion of a subdural hematoma. There were four other patients with suspected subdural or intracerebral hematoma, but in only one of these was it possible to demonstrate evidence of subdural hematoma by cerebral arteriography. We believe that this procedure, with use of Renografin, is a safer and more benign procedure than diagnostic skull trephination in patients suspected of having subdural or epidural hematoma.

In patients with subarachnoid hemorrhage the question of ruptured cerebral aneurysm is usually clarified by cerebral arteriography. Most authors⁶ are of the opinion that the diagnosis of a ruptured cerebral aneurysm should be made as early as possible so that therapy can be planned early in this dangerous disease. With the use of safer agents, such as Renografin, there should be little hesitation in performing cerebral arteriography early. Of seven patients with subarachnoid hemorrhage and one with ophthalmoplegia but no hemorrhage who were studied with use of cerebral arteriography, four were demonstrated to have saccular aneurysm of an internal carotid artery and one arteriovenous



Fig. 7 (case 7).—Arteriogram showing congenital saccular aneurysm of infraclinoid portion of right internal carotid artery.

fistula of the anterior cerebral artery. Cerebral arteriograms failed to demonstrate specific pathology in the remaining patients with subarachnoid hemorrhage.

In this series of 56 patients, brain tumor was suspected clinically in 7 and metastatic lesions in 2. Cerebral arteriograms demonstrated displacement of vessels, suggesting a space-consuming lesion, in only one.

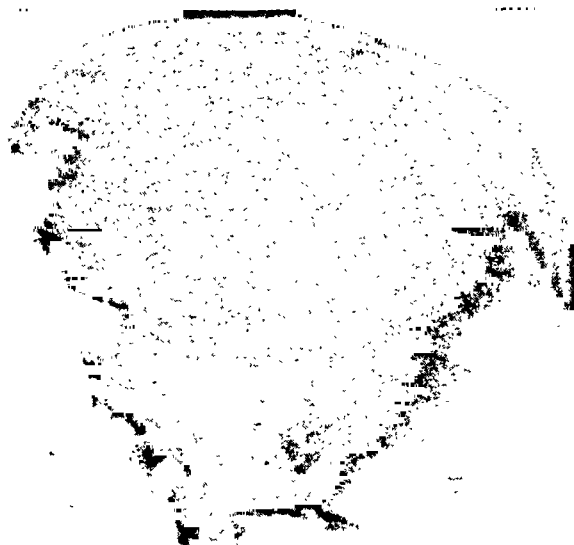


Fig. 8 (case 8).—Arteriogram with nonvisualization of left middle cerebral artery just distal to its point of origin, due to thrombosis.

In patients with cerebral thrombosis, arteriography is essential for accurate diagnosis and localization when the larger vessels are occluded. Cerebral thrombosis is usually due to one of the following conditions: thrombosis of a cerebral aneurysm, arteriosclerosis, thromboangiitis obliterans, or spontaneous occlusion.⁷ In our case, the latter condition seems to be more likely. The narrowing of the internal and external carotid arteries in the case presented may be due to spasm of these vessels.⁸

Summary

Cerebral arteriography, with use of local anesthesia, the Cournand arterial needle, and a 60% concentration of Renografin (sodium and methylglucamine diatrizoate), was performed 80 times in 56 patients. Some minor toxic reactions were encountered with the first 28 arteriograms. After improvement in our technique, there were no significant reactions with the subsequent 52 arteriograms. Cerebral arteriography has a diagnostic value in patients with congenital arteriovenous malformations, subdural hematomas, brain tumors, cerebral aneurysms, and cerebral thrombosis. This method requires neither a surgical operating room nor an anesthetist. It appears to be safe, as well as simplified. We are convinced that cerebral arteriography deserves wider use in clinical medicine.

Howard University, Fifth and W Streets N. W. (1) (Dr. Johnson).

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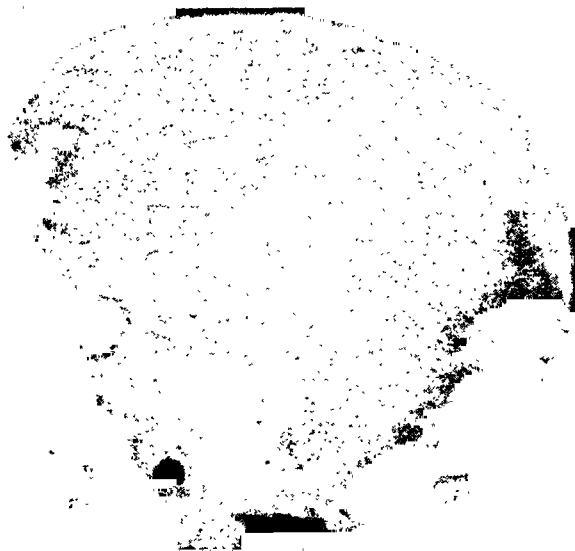


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In patients with cerebral thrombosis, arteriography is essential for accurate diagnosis and localization when the larger vessels are occluded. Cerebral thrombosis is usually due to one of the following conditions: thrombosis of a cerebral aneurysm, arteriosclerosis, thromboangiitis obliterans, or spontaneous occlusion.⁷ In our case, the latter condition seems to be more likely. The narrowing of the internal and external carotid arteries in the case presented may be due to spasm of these vessels.⁸

Summary

Cerebral arteriography, with use of local anesthesia, the Cournand arterial needle, and a 60% concentration of Renografin (sodium and methylglucamine diatrizoate), was performed 80 times in 56 patients. Some minor toxic reactions were encountered with the first 28 arteriograms. After improvement in our technique, there were no significant reactions with the subsequent 52 arteriograms. Cerebral arteriography has a diagnostic value in patients with congenital arteriovenous malformations, subdural hematomas, brain tumors, cerebral aneurysms, and cerebral thrombosis. This method requires neither a surgical operating room nor an anesthetist. It appears to be safe, as well as simplified. We are convinced that cerebral arteriography deserves wider use in clinical medicine.

Howard University, Fifth and W Streets N. W. (1) (Dr. Johnson).

The sodium and methylglucamine diatrizoate used in this study was supplied as Renografin by the Squibb Institute for Medical Research, New York.

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EFFECT OF STEROID THERAPY ON HYPERCALCEMIA AND RENAL INSUFFICIENCY IN SARCOIDOSIS

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Although sarcoidosis is generally considered to be a relatively benign disorder, death due to pulmonary and renal complications may occur in a small but significant number of patients. In 1933, Schaumann¹ described the granulomatous lesions which may develop in the kidneys of patients with sarcoidosis. Despite Harrell and Fisher's² report of the occurrence of hypercalcemia in sarcoidosis in 1939, subsequent workers continued to attribute renal insufficiency in sarcoidosis to massive granulomatous infiltrations until 1948, when Albright and Reifstein³ showed that nephrocalcinosis and renal calculi might be sequelae of the hypercalcemia and associated hypercalciuria. Other renal pathological processes such as chronic pyelonephritis have also been reported⁴ in patients with sarcoidosis and renal insufficiency. Further work suggests that hypercalcemia, per se, may lead to severe impairment of renal function.

Shulman⁵ and Dent⁶ and their associates were the earliest to report the beneficial effects of steroid treatment in correcting the biochemical abnormalities and derangement of renal function in sarcoidosis. ACTH and cortisone produced return of

The clinical and laboratory responses to steroid therapy in four patients with sarcoidosis, hypercalcemia, and renal insufficiency are presented. The predominant complaints of these patients were anorexia, nausea, vomiting, and abdominal pains simulating ulcer distress. The diagnosis of sarcoidosis was confirmed in each case by lymph node biopsy. Administration of steroids produced a prompt fall in the level of serum calcium with complete relief of symptoms, despite evidence of persistent mild renal insufficiency in three cases. Long-term steroid therapy has been necessary in these three cases to maintain an asymptomatic and normocalcemic state. The history of a fifth patient is presented to illustrate the difficulties which may be encountered in making the diagnosis of sarcoidosis. In recognized cases of sarcoidosis, studies of the serum calcium and renal function would appear desirable if irreversible renal complications are to be prevented.

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elevated serum calcium values to normal with ultimate improvement in renal function. Subsequent investigators⁷ have confirmed these clinical observations. This report of the effects of steroid therapy on the hypercalcemia and renal insufficiency in four cases of sarcoidosis, including results of balance studies in two of them, further emphasizes the value of steroids in management of patients with this entity. Case 1 has, in part, been previously reported.^{7*}

Report of Cases

CASE 1.—A 48-year-old man was admitted to the Mayo Clinic in August, 1954, with a complaint of epigastric pain suggestive of biliary colic. He had been given a diagnosis of diabetes mellitus elsewhere in October, 1953. On physical examination he appeared chronically ill. Blood pressure was 96 mm. Hg systolic and 64 mm. Hg diastolic. An enlarged spleen was palpable in the left upper quadrant of the abdomen. No peripheral adenopathy was evident. Significant laboratory findings included normal results of urinalysis, a sedimentation rate of 67 mm. in one hour (Westergren), and fasting blood sugar value of 84 mg. per 100 ml. Thoracic roentgenograms revealed diffuse fibrosis with several air blebs in both mid-lung fields. Abdominal roentgenograms revealed a nonfunctioning gallbladder and a sliding esophageal hiatus hernia with 1.5 in. of the stomach above the level of the diaphragm. Smears and cultures of the sputum and gastric washings produced no tubercle bacilli or fungi. In view of the diffuse pulmonary infiltrations, splenomegaly, and elevated sedimentation rate, the diagnosis of sarcoidosis was considered.

On Aug. 23, 1954, the gallbladder was removed. It had been chronically infected and contained stones. Multiple enlarged retroperitoneal lymph nodes were found, and several were removed. The pathological report was noncaseous granuloma chiefly in the stage of hyaline fibrosis, histologically consistent with Boeck's sarcoid. Splenectomy was not performed, since the splenic enlargement was thought to represent extensive granulomatous infiltrations. Prior to the patient's dismissal from the hospital, a program of rest and careful management of the diabetes was advised.

The patient returned in October, 1955, complaining of marked lassitude and fatigue. The diabetes had been under good control. A uremic odor on his breath was noted. The spleen no longer could be palpated. Examination of the ocular fundi revealed a few microaneurysms and cotton-wool patches. Routine urinalysis revealed albuminuria, grade 2 (on a basis of 1 to 4, 1 being mildest), and occasional hyaline and granular casts. The sedimentation rate was 105 mm. in one hour, blood urea value 128 mg. per 100 ml., calcium value 12.5 mg. and inorganic phosphorus value 4.2 mg. per 100 ml. of serum, and sugar 111 mg. per 100 ml. of blood. The serum alkaline phosphatase value was 6.7 King-Armstrong units per 100 ml., and serum protein value 7.8 Gm., with 3.6 Gm. of albumin. Roentgenograms of the chest revealed no change when compared with previous films. Repetition of the serum calcium and phosphorus tests again yielded 12.4 and 4.2 mg. respectively. A renal biopsy revealed no granulomatous infiltrations or pyelonephritis. A few spotty calcium deposits were present in the renal tubules. The diagnosis of Boeck's sarcoid with hypercalcemia and renal insufficiency was made.

The patient was studied in the metabolic unit while receiving steroid therapy. Cortisone produced a prompt decrease in the serum calcium and phosphorus values, with subsequent improvement in renal function (fig. 1). He was dismissed with advice to take prednisone (Meticorten), 2.5 mg. four times daily, later reduced to 2.5 mg. twice daily. Intermittent steroid therapy was necessary during the next

year in order to maintain serum calcium values within normal limits. In March, 1957, the patient was able to discontinue steroid therapy; but several months later hypercalcemia reappeared, necessitating resumption of a dosage of prednisone, 2.5 mg. daily. On this program he has been asymptomatic. In April, 1958, blood studies performed elsewhere revealed serum calcium value as 10.0 mg., urea nitrogen value as 37 mg., and the sedimentation rate as 40 mm. in one hour.

CASE 2.—A 59-year-old man was referred to the clinic in July, 1956, for evaluation of a diffuse pulmonary infiltration. Routine roentgenograms of the chest taken 18 months previously had revealed bilateral pulmonary infiltrations of indeterminate etiology. Subsequent roentgenograms had shown furthering of the disease process. Episodes of mild nausea and vomiting with an unexplained 30-lb. (13.6 kg.) loss of weight had occurred in the year prior to admission to the clinic. The patient denied intake of vitamin D, of milk in excess, and of absorbable alkalis.

On physical examination the blood pressure was 154/84 mm. Hg. The ocular fundi were normal and the radial pulse rate was 96 beats per minute. A fine tremor of the out-

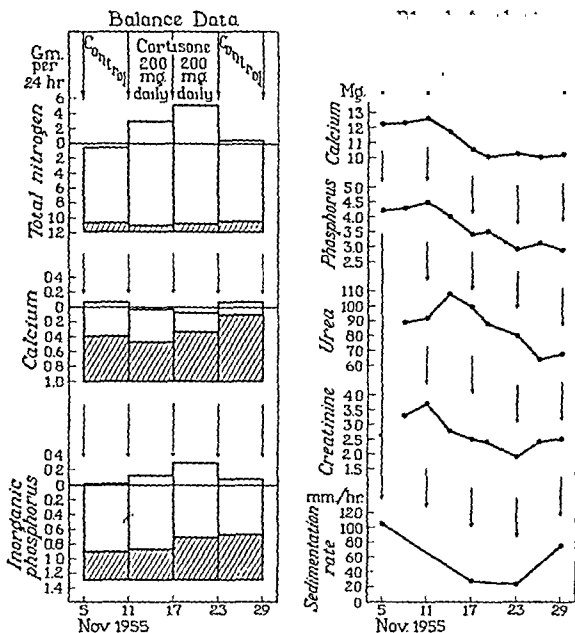


Fig. 1.—Effects of cortisone on phosphorus, calcium, and nitrogen balances and on serum calcium, inorganic phosphorus, and blood urea. In balance diagrams, daily intake is charted from zero line downward and average daily excretion (feces below and urine above) from bottom line upward. Extension of the nitrogen, calcium, or phosphorus above the zero line indicates negative balance, and clear space below zero line, positive balance.

stretched fingers was noted. The thyroid gland was of normal size but of firm consistency. No enlarged peripheral nodes were palpable. Routine urinalysis revealed a specific gravity of 1.008, an alkaline reaction, and albuminuria, grade 3. Hemoglobin value was 10.2 Gm. per 100 ml. of blood, erythrocyte count 2,900,000 per cubic millimeter and leukocyte count 7,300. The blood urea value was 74 mg. and the sedimentation rate 75 mm. in one hour. Roentgenograms of the chest revealed a diffuse pathological process in the upper portion of both lungs as well as bilateral hilar adenopathy. These findings were considered compatible with the diagnosis of Boeck's sarcoid. The roentgenographic appearance of the wrists, hands, kidneys, ureters, and bladder was

normal. The basal metabolic rate was +32 %, but findings from radioactive iodine tracer studies were normal. Because of the unexplained azotemia, serum calcium and phosphorus values were obtained. The serum calcium was 14.4 mg. and the inorganic phosphorus 4.2 mg. Serum proteins were 6.5 Gm., with 4.3 Gm. of albumin and 2.2 Gm. of globulin. The serum alkaline phosphatase value was 8.6 King-Armstrong units. Results of tuberculin skin tests using single and second strength purified protein derivative (PPD) were negative.

Surgical exploration of the right supraclavicular area disclosed several large lymph nodes which under microscopic examination revealed noncaseous granulomatous changes compatible with Boeck's sarcoid. The patient was hospitalized for a trial of steroid therapy. Prior to treatment a repetition of blood studies demonstrated 92 mg. of urea, 13.8 mg. of serum calcium, and 4.9 mg. of inorganic phosphorus. After three days of an oral dosage of 10 mg. of prednisone three times daily, the serum calcium level had fallen to 11.8 mg. but the blood urea level had risen to 120 mg. Despite this alarming finding, treatment was continued with the same dose of prednisone. Six days after the beginning of therapy

had been removed. The patient had been told that no malignancy was present but several benign "lymph node tumors" had been excised.

Physical examination gave an impression of chronic illness. The blood pressure was 134/86 mm. Hg. No lymph nodes were palpable, and the remainder of the physical findings were normal. Significant laboratory studies included a urinalysis which disclosed specific gravity of 1.005 and albuminuria of grade 1. The sedimentation rate was 91 mm. in one hour, blood urea value 82 mg., hemoglobin value 11.6 Gm., and serum protein value 6.5 Gm., with 3.6 Gm. of albumin. Roentgenograms of the chest disclosed right hilar adenopathy and fibrosis in the upper field of the left lung, while roentgenograms of the gastrointestinal tract indicated only a small diaphragmatic hernia. Review of tissue sections of the hilar lymph nodes removed elsewhere revealed noncaseous granulomatous changes consistent with the diagnosis of Boeck's sarcoid. Because of the unexplained azotemia several determinations of serum calcium were made, yielding values of 11.1, 11.9, and 12.6 mg., with corresponding inorganic phosphorus values of 4.6 and 3.5 mg. The serum alkaline phosphatase value amounted to 7.3 King-Armstrong units.

On Oct. 1, 1957, prednisone, 5 mg. four times a day to be taken orally, was prescribed. Eleven days after therapy was started the blood urea level had risen to 150 mg., but clinically the patient was much improved. His nausea, vomiting, and abdominal pain had ceased. The sedimentation rate was 55 mm. in one hour. After two weeks of treatment the blood urea level was 118 mg., serum calcium level 9.4 mg., and inorganic phosphorus level 3.0 mg. The dosage of prednisone was reduced to 2.5 mg. four times a day. After one month of therapy the patient was asymptomatic and had gained 5 lb. (2.3 kg.). At this time the blood urea level was 96 mg., the serum calcium level 9.8 mg., and inorganic phosphorus level 2.9 mg. He was dismissed with a prescription of prednisone, 2.5 mg. three times a day, and an adequate fluid intake. The patient has continued to require the same dosage of prednisone in order to remain asymptomatic. In April, 1958, the urea nitrogen level was 33 mg.

CASE 4.—A 25-year-old man was admitted to the clinic in August, 1957, with a four-month history of nausea, vomiting, and epigastric pain. In May, 1955, he had experienced recurrent epigastric pains that suggested peptic ulceration. Roentgenograms of the upper part of the gastrointestinal tract had given indications of a possible duodenal ulcer. The symptoms had been completely relieved by a liberal ulcer diet and nonabsorbable antacids. In April, 1957, the patient had noted a recurrence of the epigastric pain, for which the liberal ulcer dietary regimen had failed to provide satisfactory relief. In July, 1957, roentgenograms of the stomach and duodenum were normal, but a roentgenogram of the chest had revealed widespread bilateral pulmonary infiltrations. Studies in a tuberculosis sanatorium had failed to confirm the diagnosis of pulmonary tuberculosis. An enlarged right cervical lymph node had been removed, and microscopic examination had revealed noncaseous granulomatous changes consistent with Boeck's sarcoid. Because of the persistence of nausea and abdominal discomfort the patient had been referred to the clinic for further studies. There was no history of intake of vitamin D.

Physical examination revealed moderate illness. Blood pressure was 160/90 mm. Hg. Findings in this examination were normal except for firm, discrete, movable, nontender lymph nodes in the neck, axillas, and inguinal areas. Examination of the ocular fundi disclosed hypertensive narrowing, grade 1 to 2, without vascular sclerosis. No retinitis was present.

Pertinent laboratory studies included a urinalysis which revealed albuminuria, grade 1, microhematuria, grade 1, and occasional pus cells. Blood urea level was 78 mg. and hemoglobin level 13.4 Gm.; carbon dioxide-combining power was 29 mEq. per liter, chloride level 91.3 mEq., and serum potassium level 3.6 mEq. Serum protein level was 6.8 Gm.,

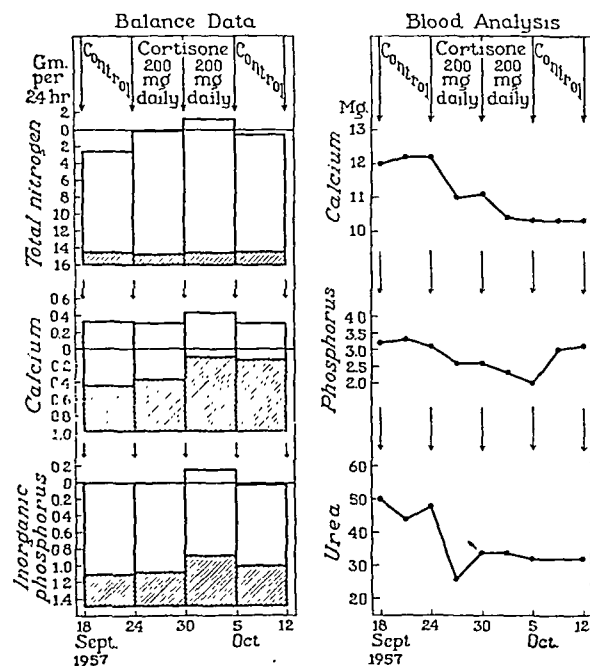


Fig. 2.—Effects of cortisone on calcium, phosphorus, and nitrogen balances and on serum calcium and inorganic phosphorus and blood urea.

the urea level was still 117 mg., but the calcium level had dropped to 10.3 mg. After two weeks of treatment the blood urea level was 84 mg., the serum calcium 10.8 mg., and the inorganic phosphorus 3.1 mg.

The dosage of prednisone was reduced to 10 mg. twice daily and the patient was sent home for further supervision of treatment by his local physician. Cortisone in a dosage varying from 35 to 50 mg. daily has been necessary to maintain a normal level of serum calcium. The patient has been asymptomatic despite persistent mild azotemia. In May, 1958, the blood urea level was 60 mg.

CASE 3.—A 68-year-old man was admitted to the clinic in September, 1957, because of anorexia, nausea, vomiting, generalized pruritus, and a weight loss of 20 lb. (9.1 kg.) in four months. In May, 1955, because of suspected bronchogenic carcinoma, an exploratory thoracotomy had been performed elsewhere and several large hilar lymph nodes

with 4.6 Gm. of albumin and 2.2 Gm. of globulin. Roentgenograms of the chest revealed generalized pulmonary fibrosis, most marked in the upper half of the lungs. The hilar shadows were normal. Roentgenograms of the skull, stomach, duodenum, kidneys, ureters, and bladder were normal. Results of tuberculin skin tests with PPD were negative. The serum calcium level was 13.1 mg. and inorganic phosphorus level 3.8 mg. Review of tissue sections from the node removed elsewhere revealed replacement of normal lymphoid tissue with multiple hard tubercles replete with giant cells but devoid of caseation. These findings were consistent with the diagnosis of sarcoidosis.

The patient was admitted to the metabolic unit for balance studies and a trial of steroid therapy. Cortisone, in a dosage of 200 mg. daily, produced a rapid drop to normal in the elevated serum calcium and blood urea levels (fig. 2). At the conclusion of the study the patient was dismissed with advice to take prednisone, 2.5 mg. twice daily. He continued the recommended program until mid-December of 1957. Four weeks after stopping this medication he noted recurrence of abdominal symptoms, so steroid therapy was resumed in the previous dosage, with complete relief of symptoms except for mild episodes of vague abdominal discomfort readily overcome by use of nonabsorbable antacids. The administration of steroids was discontinued in May, 1958, at which time the serum calcium level was 9.8 mg., the blood urea level 28 mg., and the sedimentation rate 7 mm. in one hour.

Comment

The significant biochemical alterations before and after steroid therapy are listed in the table. In light of reports that sarcoidosis occurs more frequently in females,⁸ it may be worthy of note that all four patients herein described were males. In the 14 previously reported cases⁹ involving treatment with steroids, 12 of the patients were males; and in a previous review of 8 cases of sarcoidosis with renal complications seen at the Mayo Clinic,¹⁰ all the patients were males. The significance of this apparent predilection of males with sarcoidosis for developing hypercalcemia and renal insufficiency remains conjectural but deserves further study. A positive tissue diagnosis was made in each case by lymph node biopsy.

The presenting symptoms in the reported four cases were nonspecific. Anorexia, nausea, recurrent bouts of vomiting, and vague abdominal pain simulating ulcer distress were included among the predominating complaints. These symptoms have been noted previously¹¹ in cases of hypercalcemia regardless of cause. Among the four, complete relief of symptoms occurred in each after the concentration of serum calcium was restored to normal, although in three of them mild azotemia persisted.

Balance studies carried out in two cases (1 and 4) revealed hypercalcemia, hypercalciuria, and low fecal calcium content. In both patients, cortisone produced a prompt fall in the level of serum calcium, a decrease in urinary excretion of calcium, and a subsequent increase in fecal calcium. There was an accompanying fall in the level of serum phosphorus, with increase in urinary and fecal excretion of phosphorus. Similar findings with respect to phosphorus metabolism were noted by Henne-man and co-workers.^{7c} It is interesting that steroids

produced this marked decrease in the serum phosphorus in every case despite the persistent evidence of mild renal insufficiency in three of them (see table). The increase in blood urea during the early phase of treatment was alarming. Possibly it represents an increased renal load associated with the protein catabolic effects of the steroids. In view of the calcium deposits found in the renal biopsy tissue from the first case, perhaps the persistence of renal insufficiency in three patients can be attributed to microscopic nephrocalcinosis. Daily small doses of steroids have been necessary to keep these three asymptomatic and maintain a normocalcemic state in them. In no case has the dose of exogenous steroids been of a magnitude likely to produce the clinical picture of hypercortisonism, despite the duration of the therapy.

Difficulties of Diagnosis in Complicated Cases

The difficulties which may confront the clinician in making a diagnosis of sarcoidosis in a patient with hypercalcemia, renal insufficiency, and symptoms suggesting peptic ulceration are emphasized by the following illustrative case.

*Significant Biochemical Alterations in Four Cases of Sarcoidosis with Hypercalcemia and Renal Insufficiency Before and After Steroid Therapy**

Patients	Age	Calcium Level, Mg. per 100 Ml. of Serum		Phosphorus Level, Mg. per 100 Ml. of Serum		Urea Level, Mg. per 100 Ml. of Blood	
		Before	After	Before	After	Before	After
1	48	12.5	10.2	4.2	2.9	128	68
		12.4	10.1	4.2			
2	59	14.4	10.8	4.2	3.1	74	84
		13.8		4.9		92	
3	68	11.1	9.4	4.6	3.0	82	118
		11.9		3.5			96
		12.6					
4	25	13.1	10.4	3.8	2.3	78	34
		12.2	10.2		2.5		

* All patients were men.

CASE 5.—A 56-year-old man entered the clinic in April, 1955, with the complaint of intense generalized pruritus of four months' duration. He had a 20-year history of recurrent epigastric discomfort and pain relieved by the use of soda and milk. Melena had been noted in 1941 and 1952, at which times roentgenograms of the upper gastrointestinal tract had revealed a duodenal ulcer. The bleeding and symptoms of ulcer distress had responded promptly to an ulcer dietary regimen. Generalized pruritus had been present since December, 1954, along with recurrence of the gastrointestinal symptoms. It was difficult to estimate actual intake of soda, although the patient admitted a minimum of 5 to 6 teaspoons (25-30 ml.) daily and an average intake of 2 qt. (2,000 ml.) of milk per day.

Physical examination produced an impression of chronic illness. Blood pressure was 140/82 mm. Hg. The ocular fundi were normal. Numerous excoriations of the skin were present over the entire body. There was a generalized pallor of the facies and a uremic odor on the breath. Urinalysis disclosed a specific gravity of 1.007, alkaline reaction, albuminuria of grade 1, and a few pus cells. Hemoglobin level was 6.8 Gm., the erythrocyte count 2,500,000 per cubic millimeter, and the leukocyte count 6,200. The sedimentation rate was 68 mm. in one hour. Blood urea level was 160 mg. and creatinine 6.1 mg. per 100 ml. of blood. The roentgenographic appear-

ance of the chest was normal except for evidence of calcification in a small left hilar node. In other roentgenograms the wrists, hands, kidneys, ureters, and bladder appeared normal; but roentgenograms of the upper gastrointestinal tract revealed a duodenal ulcer and a small esophageal hiatus hernia. Gastric analysis revealed 16 clinical units of free hydrochloric acid. In view of the excessive intake of soda and milk the diagnosis of milk-alkali syndrome was seriously considered. Further studies of serum calcium revealed values of 11, 10.2, and 12.0 mg., with a serum inorganic phosphorus value of 7.5 mg. Serum alkaline phosphatase value was 18.2 King-Armstrong units. Serum protein value was 6.4 Gm., with 4.2 Gm. of albumin and 2.2 Gm. of globulin. Slit-lamp studies revealed bilateral ocular band keratopathy. After adequate hydration, the level of blood urea dropped to 100 mg.

In view of these findings the diagnoses considered were (1) the milk-alkali syndrome and (2) primary hyperparathyroidism with secondary renal insufficiency. Milk and absorbable alkalis then were withheld from the diet without producing a drop in serum calcium levels, which remained around 12 mg. after two weeks of the low-calcium intake. During this time quantitative studies of urinary excretion of calcium, with the patient eating a diet containing 135 mg. of calcium per day, revealed 458, 530, 465, and 428 mg. of calcium in successive 24-hour specimens. The diagnosis of milk-alkali syndrome was considered unlikely after the hypercalcemia and hypercalciuria had persisted in the face of adequate hydration and removal of milk and absorbable alkalis from the dietary program. A diagnosis of probable primary hyperparathyroidism with duodenal ulcer and secondary renal insufficiency was made.

On May 19, 1955, the parathyroid glands were explored. Despite a thorough dissection only one parathyroid gland, the left inferior, could be identified. During the course of the dissection two large lymph nodes were found and removed from the right upper mediastinal area. Microscopic examination revealed noncaseous granulomatous changes histologically compatible with Boeck's sarcoid. Several weeks later, because of persistent epigastric pain, a subtotal gastrectomy and partial duodenectomy were performed. Prior to dismissal from the hospital and after the administration of adequate fluids the blood urea level was 88 mg., the serum calcium level 10.9 mg., and inorganic phosphorus level 4.6 mg. Under supervision of his local physician the patient was given cortisone in an average oral dose of 35 mg. daily. After several weeks of treatment marked clinical improvement was noted. His pruritus disappeared and his appetite returned to normal. Unfortunately no laboratory data are available regarding serum calcium and blood urea values during the period of steroid therapy. The medication was discontinued after six months of use.

The patient returned to the clinic in September, 1957, because of symptoms of fatigue, lethargy, and mild polydipsia. The blood pressure was 140/90 mm. Hg but otherwise the physical findings were normal except for a single soft, enlarged right axillary lymph node. Pertinent laboratory studies revealed levels of 10.4 Gm. of hemoglobin and 110 mg. of urea per 100 ml. of blood; a sedimentation rate of 36 mm. in one hour; and albumin level 4.3 Gm., globulin level 2.2 Gm., calcium level 9.1 mg., inorganic phosphorus level 4.3 mg., and alkaline phosphatase value, 12 King-Armstrong units. Roentgenograms of the chest and spinal column gave normal appearances except for

of the vertebrae. The and contained a moderate amount of albumin. The patient would not give consent for a renal biopsy. The renal insufficiency was considered as possibly due to scarring associated with microscopic nephrocalcinosis.

Exploration for a parathyroid tumor was advised when the initial diagnosis of milk-alkali syndrome seemed excluded by (1) the finding of a

significant hypercalciuria and (2) persistence of the hypercalcemia and hypercalciuria on a low-calcium diet with nonabsorbable antacids. Despite a thorough search, however, only one parathyroid gland could be found and it was normal. Enlargement of mediastinal lymph nodes, which on microscopic study revealed the typical lesions of sarcoidosis, was an unexpected finding. It could be argued that a functioning parathyroid tumor may have been overlooked; but this presupposes the presence of two separate pathological entities, each capable of causing hypercalcemia and renal damage. The apparent clinical response to cortisone would make the diagnosis of hyperparathyroidism unlikely, since adrenal steroids have been reported not to reduce the hypercalcemia of hyperparathyroidism.¹² It is unfortunate that careful laboratory data relative to the concentrations of blood urea and serum calcium during the administration of cortisone were not obtainable.

Association with Hypercalcemia and Renal Insufficiency.—The incidence of hypercalcemia in sarcoidosis has been estimated as from 20 to 30%.¹³ Despite extensive investigations the cause for the hypercalcemia has remained obscure. There is lack of correlation between the values of the serum proteins and serum calcium. Originally it was thought that hypercalcemia was found only when hyperproteinemia was present. Subsequent observations have failed to verify this association. The values of serum proteins were normal in three of the patients included in this study. Again, hypercalcemia has been an inconsistent finding when roentgenographic evidence of bone lesions has been seen in cases of sarcoidosis. Hyperactivity of the parathyroid glands has been postulated as a possible cause, but most observers have reported that the parathyroid glands were normal at the time of exploration of the neck or at autopsy.¹⁴ Previous clinical observations¹⁵ suggest that patients with sarcoidosis may be unusually sensitive to small quantities of orally administered vitamin D. On the basis of their studies Henneman and co-workers^{7b} have presented a theory of possible endogenous formation of a substance resembling vitamin D which could produce the observed biochemical alterations in these patients. Identification of such a substance is lacking, but recent observations¹² which indicate that cortisone may restore hypercalcemic values to normal in some patients with hypervitaminosis D lend support to this hypothesis. Jackson,¹⁶ in a recent report based on balance studies in four cases of sarcoidosis, has suggested that a primary renal defect produces the hypercalciuria, with the increase in fecal calcium absorption a compensatory factor.

Gleckler^{7c} has stressed that the renal insufficiency in patients with sarcoidosis may differ in several respects from renal failure produced by other causes. In some, hypertension, eyeground changes, and cardiac involvement may be minimal or lacking

and the findings in urinalysis may be normal except for low specific gravity and minimal albuminuria. As noted, roentgenographic nephrocalcinosis and renal calculi are not infrequent in cases of generalized sarcoidosis.¹⁰ Therefore it is advisable that studies of the serum calcium and renal function be made in every patient with recognized sarcoidosis so that these irreversible renal complications may be prevented. Although the mechanism by which steroids produce the observed biochemical changes remains obscure, treatment with steroids will usually relieve the patients of their distressing symptoms and may possibly prevent further renal damage.

Summary

The clinical and laboratory evidence of response to steroid treatment was demonstrated in four cases of sarcoidosis with hypercalcemia and renal insufficiency. In each case administration of steroids produced a prompt fall in the serum calcium level to normal range. All patients were relieved of their symptoms despite the persistence of mild renal insufficiency in three patients. In three cases long-term steroid therapy has been necessary to maintain an asymptomatic and normocalcemic state.

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AIDING THE PATIENT WITH A COLOSTOMY.—A colostomy is a lifesaving procedure, and as surgeons we must realize and cope with the emotional as well as the functional disturbances that a patient having a colostomy goes through, particularly in the early postoperative stages. . . . These individuals must be constantly instructed in the management of the colostomy during their hospitalization and, perhaps when it is more important, immediately after returning home. Anything that will raise the patient's morale and show him that he has not been abandoned by his surgeon will make his life easier during that time. During the hospital stay the problems that arise seem small when compared with the first few days at home. . . . We must continue in our endeavors to make the patients with permanent colostomies more and more a part of the normal working population. Continued interest should be shown in the patient by the responsible surgeon. Improvements in the anatomic, as well as the physiologic function of the colostomy, should always be sought to decrease mental as well as functional disturbances.—A. F. Castro, M.D., The Colostomy, *Southern Medical Journal*, November, 1958.

INCREASED PULMONARY MEGAKARYOCYTES—PROBABLE ROLE IN POSTOPERATIVE THROMBOEMBOLISM

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This study was undertaken in an attempt to confirm an earlier observation by Sharnoff and Kim¹ that increased numbers of megakaryocytes are noted in the pulmonary vascular bed of a large percentage of patients who die during the early postoperative period. A critical analysis of the postoperative deaths occurring in the Mount Vernon Hospital in the past 12 years (1946 to 1957 inclusive) was also undertaken. Since a causal relationship seemed possible between the increased number of pulmonary megakaryocytes and the high incidence of postoperative thromboembolism, a more careful study of the latter material was made in an attempt to seek further evidence regarding this concept.

The concept of possible causal relationship is based on observations in two earlier investigations.² In the first report, it was observed that two to three megakaryocytes per square centimeter of lung section is the normal incidence of these cells in all humans and in all other mammals examined to date and that in humans this incidence is observed in early fetal life and at all ages and appears to be a normal phenomenon. However, it was noted that increased numbers of megakaryocytes, as many as 30 or 40 or more, may be encountered in every square centimeter of lung tissue section of many patients who died of thromboembolic disease, sudden massive or prolonged chronic hemorrhage, or acute infections and of those who died in the early postoperative period. In the same study, I gained the impression that the megakaryocytes were broken up in the process of being forced through the pulmonary capillaries. The latter concept was supported by evidence that megakaryocytes are normally transported intact from the bone marrow by way of the venous circulation to the lungs and that, experimentally, when rabbits are administered epinephrine (Adrenalin) and corticosteroids there occurs an immediate, almost complete, depletion of their pulmonary vascular beds of these cells, with the simultaneous appearance of a sudden increase in circulating platelets. The second study³ also disclosed that four hours after this stimulation there occurs a reaccumulation of larger numbers of the megakaryocytes in the rabbit lung capillaries and that the rabbit, on immediate further epinephrine stimulation, reveals a more marked increase of circulating platelets. This platelet increase in these animals was found to be transient and accompanied by an even more transient blood hypercoagulability.

The incidence of thromboembolic disease after operations is reported to be increasing. Review of the autopsy records of 196 postoperative deaths revealed that 60 were ascribed to thromboembolic disease and the remaining 136 to other causes. When the 196 cases were classified according to the number of megakaryocytes per unit area seen in sections of lung, the frequency of thromboembolism as the cause of death was found to be significantly higher in the group with the highest numbers of megakaryocytes. Injections of epinephrine and corticosteroids in rabbits were followed by the disappearance of megakaryocytes from the lungs and sudden increase in circulating platelets, with transient hypercoagulability of the blood. A better understanding of these phenomena will be essential to any program for the prevention of postoperative thromboembolic disease.

The above observations prompted me to postulate that this sequence of phenomena may, in part, play a significant role in thromboembolism in general, including the all too frequent fatal thromboembolic episodes of the patient after operation.

Material

In the past 12 years a total of 1,589 autopsies were performed at this hospital. Of these, 434 involved neonatal deaths and were excluded from the study. There remained 1,155 autopsies for review. Among the latter were included 196 postoperative deaths with an equal distribution of the material as to sex. Sixty of the total deaths were due to thromboembolic disease which, with one exception, followed major operation. Classified as deaths due to thromboembolic disease were those from pulmonary embolism, coronary thrombosis and/or acute myocardial infarction, cerebral thrombosis and/or acute encephalomalacia, and other peripheral arterial thromboses, especially mesenteric artery thrombosis. Only those patients who died during or within 30 days after operation are included in this study. No clinical material is included. All stated figures are based on a total of 20,819 major operations performed in the 12-year period.

Results

The actual incidence of postoperative deaths due to thromboembolic disease that occurred in this 12-year period can only be roughly approximated. This is based on the fact that the autopsy rate averaged approximately 40% during this time. Calculated on this basis, statistics on the 60 deaths due to thromboembolic disease observed in the 196 autopsied patients, corrected for percentage, would indicate that there probably occurred about 150 deaths due to thromboembolic disease after operation in this interval. This would indicate a probable incidence of 0.7%, or one death from thromboembolic disease in every 139 major surgical procedures. Of the 60 instances of thromboembolic disease confirmed at autopsy, 23 were observed in the first six-year period with 9,500 major surgical procedures and 37 in the second six-year period with 11,200 major procedures. This would indicate an observed incidence of 0.24% in the first six-year period and 0.33% in the second six-year period, when not corrected for autopsy percentage.

An analysis of the age incidence of this disease is as follows: The average age of the patients dying of thromboembolic disease was 61.6 years. The average age of all patients dying in the postoperative period was 63.6 years. The average age of all 1,155 autopsied persons was 70.4 years. These figures merely reflect the younger average age of the surgical patient and the frequent complication of thromboembolism in the older patients. Yet, there were observed four instances of fatal pulmonary embolism occurring in the third decade of life.

A comparison of the incidence of fatal postoperative thromboembolism with that occurring in the general autopsy population was most revealing. Thus, the 60 deaths from thromboembolic disease represents 30.6% of the total postoperative deaths, compared to an incidence of 25.4% of thromboembolism in the general autopsy population. Pulmonary embolism, however, occurred in 38 patients who died postoperatively, representing an incidence of 19.4% compared to an incidence of 7.9% in the general autopsy population, exclusive of the postoperative deaths. Coronary artery thrombosis and/or acute myocardial infarction was observed in 4.5% of the patients who died postoperatively, compared to a 15% incidence in the general autopsy population. The incidence of cerebral thrombosis and/or encephalomalacia or other peripheral vascular thrombosis was too small to offer valid comparisons.

The time of death from thromboembolic disease after operation was studied, eliciting the following information: Forty-one of the 60 patients who died of thromboembolism died within the first eight days. The highest incidence occurred on the fourth to eighth days. In the latter period, there were noted 18 instances of pulmonary embolism and 7 of peripheral vascular thrombosis, including 4 of

cerebral thrombosis and/or encephalomalacia. The highest incidence of coronary thrombosis and/or acute myocardial infarction was observed in patients who died the day of operation.

Lung-tissue sections from all patients who died after operation were examined and classified according to the numbers of megakaryocytes encountered in each square centimeter of tissue. The material could be divided into three groups. In group 1 were those patients whose lungs revealed a normal number, namely, two to three megakaryocytes per square centimeter of lung section. In group 2 were those with 5 to 10 cells and in group 3 those with 10 or more cells per square centimeter of lung section. Thus, those in groups 2 and 3 represented the patients whose lungs disclosed the presence of an increased number of megakaryocytes. Forty (66.6%) of the 60 patients dying of postoperative thromboembolic disease were classified in groups 2 and 3. The remaining 136 subjects revealed an equal number in group 1 as in groups 2 and 3 combined. These figures compared favorably with those obtained in the earlier report, in which patients who had died of thromboembolic disease had an incidence of 58.9% of increased pulmonary megakaryocytes.

Comment

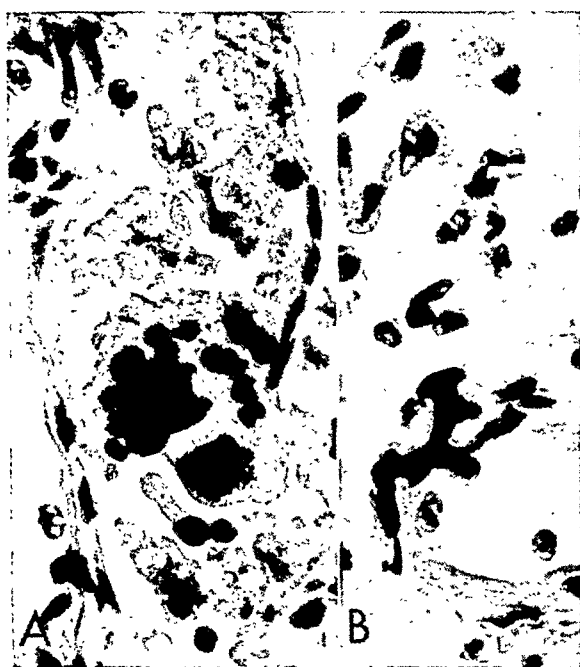
Much of the information derived from this study appears to confirm the observations made in the recent past by a number of investigators. Thus, Allen,³ De Bakey,⁴ De Takats,⁵ Ochsner and De Bakey,⁶ Parker and Smith,⁷ and Ravdin and Kirby,⁸ to cite a few, have also observed an ever-increasing incidence of thromboembolism after operation. These workers refer exclusively to the occurrence of pulmonary embolism. This increase appears to be taking place despite the careful application of early ambulation, the use of anticoagulation, and, as with Ravdin and Kirby⁸ and Roe and Goldthwait,⁹ the institution of femoral vein ligation.

No reference is made in the literature to the other forms of thromboembolism mentioned here, which, though much less frequently encountered than pulmonary embolism, yet as observed here pose an often fatal postoperative complication. Referred to are the few instances of coronary thrombosis and/or acute myocardial infarction, cerebral thrombosis and/or encephalomalacia, and other peripheral arterial thromboses. It would appear from this material that the above-mentioned forms of thromboembolism should be included with pulmonary embolism as postoperative complications. The material presented here includes these latter forms of thromboembolism and explains an apparent greater incidence of thromboembolism in this material.

These figures also support the observations of Towbin¹⁰ that thromboembolism is a frequent phenomenon in older persons. However, its occurrence in four young patients, in the third decade of life,

in this material indicates that it may also be a serious complication of the young patient after operation.

A relationship may exist between the observed increase in the number of pulmonary megakaryocytes and the incidence of thromboembolic disease. In an earlier report, it was demonstrated that the presence of megakaryocytes in the pulmonary vascular bed is a normal phenomenon observable in all mammals investigated to date. It was also shown that these cells are transported ostensibly from the bone marrow to the lungs via the venous circulation and appear to break up into cell fragments or platelets under the pulsating action of the heart's right ventricle when forced through the lung capillaries (see figure). Thus, the lungs may serve as an important site of platelet formation. It is, therefore, possible to assume that, if a greater number of



Photomicrographs, showing, A, megakaryocytes in pulmonary precapillary blood vessel and, B, megakaryocyte breaking up in pulmonary capillary anastomoses ($\times 710$).

megakaryocytes enter the pulmonary vascular bed simultaneously, this should be reflected by the appearance of an increased number of platelets in the peripheral circulation. Thus, a sudden marked increase in circulating platelets may be a reflection of the disintegration of an increased number of megakaryocytes in the lung capillaries. In 1944, Adams¹¹ reported observing a marked thrombocytosis in patients in the early postoperative period. He later associated this finding with stressful stimuli such as fever, severe exercise, anoxia, hemorrhage, trauma, and operation. Yet, he failed to reproduce the thrombocytosis in rabbits, mice, and rats after the administration of large doses of epinephrine.¹² However, Adams performed platelet counts at 1, 4, 8, and 24 hours.

Unaware of Adams' study, Kim and I¹ were successful and demonstrated a significant increase in platelets in the capillary venous blood obtained from the rabbit ear after subcutaneous administration of epinephrine. The thrombocytosis was observed, however, at the 15-minute and 30-minute intervals and was transient, for at the 90-minute interval the platelet counts had returned almost to preinjection levels. With the thrombocytosis there was observed an even more transient associated blood hypercoagulability.

It may well be that this added factor of transient blood hypercoagulability triggered, as described above, by a sequence of stressful stimuli may explain thromboembolism in general and the greater incidence of thromboembolic phenomena in major operations especially. The material reviewed here is in general agreement with the reports appearing in the literature indicating a continued significant increased incidence of pulmonary embolism in the patient after operation despite all efforts to counteract the anticipated venous stasis in the lower extremities, which is generally believed to cause phlebothrombosis and the subsequent, often fatal, thromboembolism. Yet, it is clear from all statistics that the incidence of thromboembolism in other long-hospitalized or long-bedridden patients with the attendant venous stasis is far lower than that observed in the patient who has undergone a major operation. This would appear to indicate that some additional factor or factors must play a significant role in this phenomenon, and it may well be a transient blood hypercoagulability. This may also be the basis for the observation by White¹³ recently, in discussing the epidemiology of heart disease, that "coronary thrombosis is not simply a problem of atherosclerotic disease of the coronary artery wall; it involves the blood clot too and the greater tendency for the blood to clot in some individuals than in others." From evidence at this hospital it would appear that this blood hypercoagulability may be triggered by stressful stimuli in general and, as in this material, by the stress of major operation in particular.

From the above statements, it would appear that a more critical study of the patient subjected to operation is needed in order to devise a more thorough program of prevention of thromboembolism. Since the material presented indicates that the first eight postoperative days, including the day of operation, are the most critical, a careful scrutiny of this period in the light of the concept described here may be rewarding.

Summary and Conclusions

In 196 autopsies in patients who died shortly after operation, an increased pulmonary megakaryocytosis was observed. This appeared to be associated with stress, as in a major operation.

Thrombocytosis may be a reflection of stress effect in the presence of increased pulmonary megakaryocytes and may indicate a recently existent transient

blood hypercoagulability, as an underlying cause of thromboembolism. The possible relationship of increased pulmonary megakaryocytosis to thromboembolism would appear to indicate a need for a more critical evaluation of surgical material in order to evolve a more rational program of prevention of this frequently fatal complication.

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This study was supported, in part, by a grant from the Westchester Heart Association.

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PROPHYLACTIC TRACHEOSTOMY IN AGED AND POOR RISK GENERAL SURGICAL PATIENTS

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and

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The value of tracheostomy in the postoperative care of certain thoracic and neurosurgical patients has been recognized for some time,¹ but there has not been widespread acceptance of this procedure as an adjunct to therapy for the critically ill general surgical patient. The present report concerns the prophylactic use of tracheostomy in a series of aged and bad risk patients. For each of these patients a major operation was deemed mandatory, but the prognosis for immediate postoperative survival was poor because of debilitation and independent pulmonary or cardiovascular disease. The objectives of tracheostomy were to allow maximum utilization of pulmonary reserve and to prevent postoperative pulmonary complications.

The most common postoperative complications are related to the respiratory system.² These complications, which may only be a source of morbidity in younger people, carry serious implications for feeble geriatric or poor risk patients. Preexisting

The most common postoperative complications are those involving respiration, and they are especially dangerous to patients classified as poor risks because of age or other handicaps. Among the 11 patients whose histories are given, some who were nearly moribund from respiratory difficulties were saved by tracheostomy; others made good recoveries from major surgery under conditions that would have been hopeless without the help afforded by prophylactic tracheostomy. If this possibility is foreseen, an orderly procedure can be carried out in the operating room instead of desperate measures on the ward. Scrupulous care of the tracheostomy is essential; this includes aseptic precautions, humidification of the inhaled air or oxygen, and the systematic but gentle use of suction to aspirate accumulating mucus.

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pulmonary disease plus loss of the strength necessary for powerful coughing and ventilation have already reduced the respiratory reserve. The additional factors of anesthesia and postoperative pain may lead to a condition in which retained secretions, atelectasis, and pneumonitis are lethal. A pulmonary complication can develop with such subtlety that its presence is not suspected.¹ The resultant anoxia or hypercapnia may be manifest in altered function of the heart, brain, kidney, or other organs in this type of patient. These structures often exhibit such marked pathological changes that compensated function can continue only within a narrow margin of safety and under optimal environmental conditions. The cause of death in these circumstances is frequently designated as coronary occlusion, cerebrovascular accident, renal failure, or other cause, while actually the initiating factor was disruption of a delicately balanced homeostatic state by hypoxia.

It has been our experience with poor risk patients that pulmonary complications can be predicted with a high degree of accuracy on the basis of the preoperative history and physical examination. In the past we have treated these patients by standard methods of preoperative and postoperative bronchopulmonary toilet,³ only to see problems of hypoxia and/or hypercapnia develop. If a respiratory complication arises in this type of patient, treatment by any means is likely to be unsuccessful.

Postoperative pulmonary difficulties were anticipated in the patients included in the present study. The cases were reviewed with the department of anesthesiology and the decision for prophylactic tracheostomy was usually made well in advance of the proposed operation. Tracheostomy was done in the operating room immediately after completing the primary procedure or during the first few postoperative hours.

It has been our impression that tracheostomy has extended the limits of operability to include certain aged and poor risk patients who could not otherwise have been expected to survive a major surgical procedure. The present report documents the use of this prophylactic measure in one of the general surgical charity services of the Jackson Memorial Hospital during a recent three-month period (January through March, 1958).

Report of Cases

CASE 1.—This moribund 65-year-old woman was admitted on Jan. 6, 1958, after six days of abdominal pain, vomiting, and distention. Examination showed wet lungs and peritonitis with abdominal distention. X-rays showed bilateral basilar atelectasis, massive pneumoperitoneum, and distention of the small intestine. At celiotomy, a perforated sigmoid diverticulum was found, with fecal peritonitis and adhesive obstruction of the ileum. Treatment consisted of closure of the perforation, transverse colostomy, decompression of the small intestine,

lysis of adhesions, abdominal drainage, and gastrostomy. Digitalization was necessary during surgery. Tracheostomy was performed after wound closure. Postoperatively the patient improved steadily for six days, and then had an exsanguinating gastric hemorrhage necessitating rapid replacement with 2,500 cc. of blood and 1,000 cc. of plasma expander. She was reexplored, and a bleeding prepyloric ulcer was found and suture-ligated. Anesthesia was induced through the tracheostomy. Tracheobronchial care, including management of aspirated blood, was facilitated by the tracheostomy. She recovered slowly until bleeding recurred four days later, requiring a transfusion of 3,000 cc. of blood, at which time she was returned to surgery for gastrectomy. Anesthesia was again induced through the tracheostomy and bronchoscopy was performed at the conclusion of the procedure. Her recovery was slow but without further complication. On Feb. 3, radiography showed that the atelectasis which was present at the admission had cleared. The cannula was removed 32 days after admission. She was discharged on Feb. 17 and has remained well since.

Comment.—This critically ill patient would probably not have survived any one of the three procedures without a carefully managed tracheostomy. At the time of gastric hemorrhage, blood aspiration was so overwhelming that no other measure would have allowed the consistent maintenance of a patent airway.

CASE 2.—This 57-year-old man, with an incompletely obstructing carcinoma of the rectum, was admitted with chills, fever, dyspnea, and diarrhea and had lost 40 lb. (18.1 kg.). His chest was emphysematous with diffuse rales bilaterally. Chest x-ray revealed chronic interstitial fibrosis. He was treated for bronchopneumonia with clinical improvement but without striking change in the x-ray findings. On Feb. 7, 1958, an abdominoperineal resection was done, followed by a prophylactic tracheostomy. The patient's early convalescence was uncomplicated and the tracheostomy was removed on the sixth postoperative day. He developed obstruction of the small intestine eight days after surgery which was unresponsive to intestinal intubation. Lysis of adhesions was carried out three days later and the tracheostomy cannula was replaced through the original incision. Seven days after reexploration he resumed a full diet and the cannula was again removed. He was discharged on March 10 and has been well since.

Comment.—In this case tracheostomy was indicated by chronic disabling lung disease with a recent superimposed acute infection.

CASE 3.—This 74-year-old man was admitted with a four-month history of pain in the right upper quadrant and had lost 40 lb. (18.1 kg.). There was a palpable mass in the right upper quadrant. For the preceding nine years he had had progressive dyspnea and severe asthma. Examination revealed an emphysematous chest with widespread inspiratory and expiratory wheezes. Chest fluoroscopy showed diffuse air trapping, enlargement of the pulmonary artery, and fixed diaphragms. Electrocardiogram findings suggested coronary insufficiency. At operation on Feb. 7, 1958, he was found to have empyema of the gallbladder and a walled-off subhepatic abscess which contained many stones. The gallbladder and abscess were excised, the common ducts explored, a T-tube was inserted, and tracheostomy was performed. During convalescence the tracheostomy was supplied with room air which had been pumped through Alevaire (sterile aqueous solution of Superinone [oxethylated tertiary octyl-phenol-formaldehyde polymer] in combination with glycerin

and sodium bicarbonate). The use of bronchodilators, which had started a week before surgery, was continued. Postoperative tracheobronchial care was not a problem, even though the patient was disoriented and irrational during the first four days. On the sixth day after surgery the cannula was removed. He was discharged on the 13th day after operation and subsequently has had the T-tube removed in the clinic.

Comment.—Prophylactic tracheostomy was done because this patient was a pulmonary cripple. In patients with emphysema the use of pure oxygen should be avoided because of the danger of inducing hypercapnia.

CASE 4.—This 79-year-old man was admitted for treatment for carcinoma of the stomach. He had been followed in the medical clinic for two years with intractable heart failure. On admission he suffered from decompensation, with edema, bilateral massive pleural effusion, rapid atrial fibrillation, and uremia. An abdominal aortic aneurysm was present with peripheral vascular insufficiency (no pulses below the femoral arteries). A radical subtotal gastrectomy was performed on Feb. 7, 1958, after extensive preparation. Prophylactic tracheostomy was done at this time. His immediate postoperative condition was satisfactory, but two days after surgery he developed evidence of cerebral and femoral emboli. A left iliofemoral embolectomy was carried out. Several toes became gangrenous and on Feb. 13 a mid-thigh amputation was done. His condition gradually deteriorated and he developed giant decubiti. Despite the tracheostomy, tracheobronchial care became progressively more difficult. He died one month after surgery, on March 7, 1958. Autopsy findings included extensive old infarct of the left ventricle, recent mural thrombus of the left atrium, multiple renal infarcts, severe generalized arteriosclerosis, bilateral bronchopneumonia, and various pathological signs of cardiac decompensation.

Comment.—This was the only patient in the series in whom a pulmonary complication arose after tracheostomy. The development of severe terminal bronchopneumonia must be explained by inadequate tracheostomy care.

CASE 5.—This 83-year-old man was admitted on Feb. 7, 1958. He had been followed for five years in the outpatient department because of hypertension and periodic heart failure. He had been known to have complete left bundle-branch block for this period. Chest x-ray on admission showed bilateral pulmonary congestion. On the day of admission cholecystectomy was performed for gangrene of the gallbladder. Prophylactic tracheostomy was considered at the time of surgery but was not done. Although he recovered promptly from anesthesia, during the next 10 hours he became moribund with irrational and irritable behavior, tachycardia, and wet lungs. Endotracheal suction gave only temporary relief. Tracheostomy was done at this time. Improvement was rapid and after a few days recovery seemed assured. He subsequently developed a subhepatic abscess, which was drained with the patient under local anesthesia. Massive hemorrhage occurred from the depths of the abscess during the third, fourth, and fifth postoperative weeks, necessitating transfusions of 6,000 cc. He developed intractable heart failure and died on March 18, 1958. During his last week of life he required repeated thoracenteses for a right pleural effusion. Serial chest x-rays during the five-week postoperative period showed no evidence of intrapulmonary complication except for atelectasis at the right base of the right lung, which was thought to be secondary to the subhepatic abscess. Permission to perform autopsy was not granted.

Comment.—This patient served as his own control in evaluating the role of tracheostomy in the determination of immediate postoperative survival. Prophylactic tracheostomy was considered at the time of surgery and rejected. As a result of this error in judgment the tracheostomy became an urgent measure several hours later, after his condition had deteriorated badly.

CASE 6.—This 85-year-old man was admitted for the treatment of a large carcinoma of the gastric antrum. He had been receiving digitalis since a myocardial infarction 15 years prior to admission, and for one year heart failure had been increasingly difficult to control despite constant bed rest. Physical examination revealed an emphysematous chest with distant breath sounds. He was a very feeble old man. Chest x-ray showed emphysema and slight cardiomegaly. An electrocardiogram revealed a complete left bundle-branch block. On Feb. 18 radical gastrectomy was performed, with removal of 85% of the stomach, and a prophylactic tracheostomy. The tracheostomy was postoperatively supplied with oxygen which had been passed through Alevaire. Although he aroused promptly after anesthesia, he was alternately confused and comatose until the fourth postoperative day, but subsequently improved rapidly. The cannula was removed on the sixth postoperative day and the patient was discharged 13 days after surgery. He has continued to do well and is now living at a convalescent home.

Comment.—This octogenarian had not been able to leave bed for one year prior to admission due to severe heart disease complicated by emphysema. The prevention of anoxia during a difficult convalescence was facilitated by the tracheostomy.

CASE 7.—This 75-year-old man was admitted on Feb. 21, 1958, with abdominal pain and jaundice. Chest x-ray revealed bilateral basilar atelectasis. His condition deteriorated rapidly and within four days he developed anuria, hyperpyrexia, and hypotension. On the fifth day after admission, common duct drainage and tracheostomy were performed with the patient under local anesthesia. The patient's temperature then returned to normal, and kidney function was restored. The jaundice deepened, however, and the patient died 26 days after surgery. At autopsy the basilar atelectasis was found to have cleared and the only pulmonary abnormality was congestion of the lungs. Autopsy also revealed far-advanced biliary cirrhosis with multiple intrahepatic stones in both the right and left hepatic ducts.

Comment.—Like several other patients in this series this man went into surgery with a previously established respiratory complication. The pulmonary status improved with tracheostomy despite deterioration of his general condition.

CASE 8.—This 49-year-old man had an 11-year history of progressive muscular dystrophy involving both legs and both arms as well as the accessory muscles of respiration. He had one-block exercise tolerance and after prolonged conversation became dyspneic. On Feb. 28, 1958, he underwent cholecystectomy and common duct exploration. Because of his neurological disability a prophylactic tracheostomy was done. Because of feeble respiratory efforts and excessively thick mucus there was great difficulty in keeping the tracheobronchial tree clean postoperatively. He was disoriented for the first two days after surgery and on the second day he aspirated gastric contents and nearly became asphyxiated. Suction was applied immediately and bronchial wash

carried out with saline solution. He showed improvement after this, but a chest x-ray on the fourth postoperative day showed disk atelectasis at both bases. His chest gradually cleared and the tracheostomy cannula was removed 10 days after surgery. He was discharged home two days later.

Comment.—Extensive neurological disability made postoperative tracheostomy mandatory in this case. Death from aspiration of gastric contents in the early postoperative period would probably have resulted without this precaution.

CASE 9.—On March 5, 1958, this 74-year-old woman was brought to the emergency room in shock after having been struck by an automobile. She had multiple injuries, including a traumatic amputation of the left leg, extensive soft tissue injury of the right leg, hemothorax, and fractures of the left second to eighth ribs, left scapula, and right superior and inferior pubic rami. After transfusion of 4,000 cc. of blood and plasma she was taken to the operating room for a left supracondylar amputation and débridement of other wounds. Tracheostomy was not done. Fifteen hours after surgery she was irrational, dyspneic, ashen, and clammy. Tracheostomy was performed with immediate benefit. Her condition was critical for many days but improvement was steady. The hemothorax was evacuated with repeated thoracenteses. Despite the serious chest wall injury neither atelectasis nor pneumonitis developed. The tracheostomy tube was removed on the eighth postoperative day. The patient was discharged in good condition on the 22nd postoperative day, and has subsequently returned to her home in New Jersey.

Comment.—This is the type of crushed-chest injury for which Carter⁴ recommended early tracheostomy. The unnecessary delay in this case nearly cost the patient her life.

CASE 10.—This 71-year-old man had had dyspnea on exertion and severe nocturnal asthma for several years. Chest x-ray and electrocardiogram were normal. The present admission was for unremitting obstructive jaundice. On March 10, 1958, a pancreaticoduodenal resection was performed. Prophylactic tracheostomy was considered because of the patient's history of asthma but was not done. For the first few hours after surgery there were no pulmonary difficulties but after this the patient's condition deteriorated rapidly despite the use of bronchodilators, forced coughing, and endotracheal suction. He developed extreme dyspnea, carphology, hallucinations, tachycardia, and bilateral diffuse rales. His condition was grave 18 hours after surgery. Tracheostomy was performed with removal of profuse thick secretions and the patient showed immediate improvement. Subsequently he developed persistent fever and nine days postoperatively a subhepatic abscess was drained. His condition again improved but on March 28 he developed high intestinal obstruction. He was reexplored on April 2, and jejunal obstruction was found in the wall of the subhepatic abscess. A gastrojejunostomy and feeding jejunostomy were done below this point, after which he gradually and steadily improved. The tracheostomy tube was removed on April 10, one month after the pancreaticoduodenectomy, and the patient was finally discharged on May 8, 1958. Despite his postoperative experiences there was never any evidence of pneumonitis or atelectasis on serial x-rays.

Comment.—There will not be unanimity of opinion about the need for prophylactic tracheostomy in some patients. Because of a reluctance to employ tracheostomy unless specifically required, we have allowed a postoperative trial period, in borderline

cases, during which the patient is closely observed for evidence of pulmonary difficulty. If the slightest complication develops, tracheostomy should be done without delay.

CASE 11.—This 65-year-old man was referred from another hospital for treatment of a large chondrosarcoma of the left shoulder. He had had pulmonary tuberculosis in his youth, and 17 years previously had undergone nephrectomy for tuberculous pyelonephritis. He took digitalis daily and had been in heart failure recently. He had dyspneic for 10 years and had needed convalescent home care for the past 2 years. Examination showed cyanosis, kyphosis, markedly emphysematous chest, and diffuse wheezes over both lung fields. Chest x-rays showed bilateral apical scarring and emphysema. Electrocardiogram disclosed complete right bundle-branch block. Maximum breathing capacity was 27 liters per minute. Vital capacity was 2,700 cc. Timed vital capacity showed a 31%, 42%, and 52% expiration in 1, 2, and 3 seconds. The diagnoses were advanced pulmonary emphysema and cor pulmonale. Bronchodilators were used preoperatively and the patient was given positive pressure breathing exercises. On March 19, 1958, left interscapulothoracic amputation and tracheostomy were done. Room air pumped through Alevaire was used postoperatively to supply the tracheostomy cup. Convalescence was uncomplicated and the cannula was removed on the fifth day after surgery. He was discharged on the 12th postoperative day.

Comment.—This patient was referred from an outlying hospital for consideration of radiotherapy, since it was thought that his condition precluded extirpative therapy. The use of prophylactic tracheostomy was probably a critical factor in permitting reversal of this decision.

Comment

Until the last two decades the indication for tracheostomy was rigidly defined as mechanical upper airway obstruction. The broader utility of this procedure in the treatment of secretional airway obstruction was not realized until Galloway's report⁵ on the use of tracheostomy in the treatment of bulbar poliomyelitis. Tracheostomy has subsequently become accepted treatment in a variety of clinical conditions in which mechanical obstruction is not a major factor, including coma from any cause, tetanus, respiratory burns, tracheobronchitis, traumatic chest injuries, and the postoperative state after major thoracic and neurosurgical procedures.⁷

In describing the management of crushed-chest injuries Carter⁴ defined the following benefits to be derived from the use of tracheostomy: reduction in the respiratory dead space, decrease in the resistance to air flow, and increase in the ease of management of tracheobronchial secretions in patients who cannot or will not cough. In addition, by diminishing the effort necessary for ventilation, pain is relieved. The advantages of tracheostomy are applicable to the care of geriatric and poor risk patients who have had major abdominal surgery. These people have a respiratory reserve so limited that maximum utilization of pulmonary function is necessary for their postoperative survival. They are

handicapped by an increase in bronchopulmonary dead space," by an emphysematous and fixed chest, and by muscular weakness. The problem is further aggravated by incisional pain with splinting, suppression of coughing, and the consequent accumulation of tracheobronchial secretions. These unfavorable conditions are all at least partially alleviated by tracheostomy. The dead space is reduced, decreasing the tidal volume necessary for the same alveolar ventilation; the elimination of upper airway resistance diminishes the muscular energy expended for respiration and the more effortless ventilation can be performed with less pain; and the management of tracheal secretions is brought under moment-to-moment control. The value of tracheostomy under these circumstances was realized by Baronofsky,⁷ who, in addition to having advocated the procedure for crushed-chest injuries prior to Carter's report, has alluded to the systematic use of tracheostomy in aged and debilitated general surgical patients.

If recovery from surgery is uncomplicated, the total period of hospitalization is not significantly increased by the presence of the tracheostomy. After a trial period of occlusion the cannula can usually be withdrawn within the first postoperative week and the patient can be discharged a few days later (cases 3, 6, 9, and 11). When nonrespiratory complications have occurred we have found the presence of the tracheostomy to be a factor on which survival (cases 1, 2, 8, and 10) has often depended.

The necessity for scrupulous care of the tracheostomy is universally recognized but so important as to justify reiteration here. Exclusion of the larynx from the airway has deprived the patient of whatever power he possessed to cough explosively, and he is now at the mercy of those entrusted with the hygiene of his tracheobronchial tree. If suction is not applied at regular intervals he will be in a more indefensible state than if tracheostomy had never been done. It is taught at most nursing centers that the tip of the suction tube should not pass beyond the inner extent of the cannula, but if this practice is carried out secretions will pool beyond the end of the tracheostomy. Nursing personnel must be taught to apply suction deeply, but with frequent rest intervals,⁸ with a Y-tube to avoid traumatizing the mucosa. For most of the patients reported here oxygen was furnished to a plastic tracheostomy cup, and for those with severe emphysema compressed air was employed. Humidification was obtained by passage of the gas through a wetting agent (Alevaire). Aseptic precautions must be employed in tracheostomy care, for severe tracheobronchitis can be precipitated by careless handling of the suction catheters.

In the present series an effort was made to anticipate the need for tracheostomy on the basis of preoperative evaluation. Tracheostomy was done in this series only on a group of patients who might otherwise not have been able to undergo major surgery. In three cases elective tracheostomy was considered and rejected, and in these instances what could have been an orderly procedure in the operating room became a desperate measure on the ward. Experiences like these have tended to lower our originally stringent criteria for the performance of prophylactic tracheostomy.

Summary

Prophylactic tracheostomy was used postoperatively for aged and debilitated general surgical patients. The objectives were to allow maximum utilization of pulmonary reserve and to prevent postoperative pulmonary complications. In a recent three-month period in one of the general surgical services at Jackson Memorial Hospital, 11 patients underwent this procedure after various major operations. These people constitute a group for which it was thought that extensive surgery would uniformly have been fatal without the postoperative use of tracheostomy. Eight of the patients were completely rehabilitated. The remaining three died of late complications of the primary disease and in only one case did a pulmonary complication materially contribute to death. On the basis of this experience it is suggested that the judicious use of tracheostomy is a means of extending the limits of operability to include certain aged and poor risk patients who might not otherwise be expected to survive a major surgical procedure.

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Rh FACTORS RELATED TO THE Rh₀ FACTOR AS A SOURCE OF CLINICAL PROBLEMS

DIAGRAMMATIC REPRESENTATION OF THEIR REACTIONS AND PREDICTION OF STILL UNDISCOVERED Rh FACTORS

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The demonstration of the role of isosensitization to the Rh factor in the pathogenesis of hemolytic transfusion reactions and in erythroblastosis fetalis (hemolytic disease of the fetus and newborn infant) stimulated much interest in this subject. Examination of serum from isosensitized patients showed that while at least 90% of them gave reactions paralleling in specificity the original anti-rhesus serum of Landsteiner and Wiener, the balance detected different blood factors of related specificities. The Rh-Hr blood group system is now known to be quite complicated and to comprise a set of so-called Rh factors as well as a set of reciprocally related Hr factors. The serology, genetics, and nomenclature of the Rh-Hr types have been the subject of a recent report.¹

In the Rh-Hr system the Rh₀ factor holds a special position. It is by far the most antigenic of the Rh-Hr blood factors and the usual source of clinical complications. For this reason the symbol for the Rh₀ factor has been assigned a capital "R" to set it apart from the other Rh-Hr factors. While the Rh₀-negative person is in greatest jeopardy of clinical complications, the Rh₀-positive person is not immune, since on rare occasions such persons have become sensitized to Rh-Hr factors other than Rh₀ lacking from their blood cells.² Of special interest is the recent discovery that Rh₀-positive persons may form antibodies closely resembling anti-Rh₀ in specificity, giving rise to the seeming paradox of an Rh-positive individual sensitized to the Rh factor.³ The purpose of this report is to summarize some of the recent observations on the newly discovered set of Rh factors and to offer a diagrammatic representation which may help with the understanding of the serologic reactions involved.

In a series of publications,⁴ the distinction between an agglutinin and its serologic attributes, or blood factors, has been delineated and the assertion made that the number of blood factors characterizing each agglutinin is limited primarily by one's enterprise and ingenuity in searching for and identifying antibodies of "new" specificities. This prediction has been fulfilled, in the

In the theory of hemolytic transfusion reactions and of hemolytic disease in the fetus and the newborn, the Rh₀ factor holds a special position. It is the most antigenic of the Rh-Hr blood factors and the usual source of clinical complications. Because of the recent discovery of new antibodies within this system it has become necessary to assume that standard Rh-positive blood contains factors Rh^A, Rh^B, Rh^C, and others, as well as Rh₀. The theory and nomenclature here developed makes it easier to understand the interrelations of these factors and should aid the physician in solving certain puzzling clinical problems. Its predictive value makes it helpful in planning further investigations.

case of the Rh-Hr blood types, by the discovery in recent years of a number of additional Rh-Hr antibodies. Of particular interest are those antibodies identifying a series of blood factors associated with the blood factor Rh₀,⁵ since, as has been pointed out, blood factor Rh₀ holds a position of special importance, both serologically and clinically, in the Rh-Hr system.

The common characteristics of the recently discovered antibodies, related to anti-Rh₀, are as follows: They are found in the plasma of persons having what appear to be typical Rh agglutinogens or variants of the Rh₀ factor in their red blood cells. (Agglutinogens of the Rh set include all those agglutinogens which have in common the blood factor Rh₀, namely, agglutinogens Rh₀, Rh₁, Rh₂, and Rh₃.) Attention is generally attracted to the cases by the occurrence of a hemolytic transfusion reaction, or the birth of an erythroblastotic baby, after which an antibody is detected in the Rh-positive patient's serum which seems to be identical in specificity with anti-Rh₀ but which does not react with the patient's own red blood cells or those from certain other persons. The symbol anti-Rh^A was assigned to the antibody described by Wiener and Geiger,³ and the corresponding blood factor was designated Rh^A. Other

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similar antibodies, such as the one previously reported by Argall and co-workers³ and still another encountered by Rosenfield and associates,⁶ proved to be different in specificity, and to them no specific symbols have as yet been assigned. We have identified still another potent Rh antibody in the serum of an Rh-positive woman who had had a hemolytic transfusion reaction.⁷ This case and the properties of the antibody will be described more fully in a separate communication. For the purpose of this paper, it is sufficient to point out that the antibody is different from anti-Rh^A in specificity, and it has been assigned the symbol anti-Rh^B. We have recently identified still a third similar antibody, designated as anti-Rh^C. This will also be described more fully in another communication.

Studies of the distribution and serologic characteristics of the Rh^A factor will be presented elsewhere. Since anti-Rh^B and anti-Rh^C were found more recently, the number of Rh-positive blood specimens tested for all three blood factors, Rh^A, Rh^B, and Rh^C, is still limited. Nevertheless, enough data have already been accumulated to indicate that these three blood factors may occur in an Rh agglutininogen in any of the eight theoretically possible combinations. It is necessary to emphasize, however, that "standard" Rh-positive blood has all the blood factors Rh^A, Rh^B, and Rh^C, as well as Rh₀, while red blood cells giving any of the other theoretically possible reactions are found in only about 1.6% of Rh-positive Negroes and in only about 0.1% of Rh-positive Caucasians.

Diagrammatic Representation

As a diagrammatic device for representing the Rh₀ portion of Rh agglutinogens, the outline of the human hand proves to be satisfactory. The webs at the bases of the four interspaces between the fingers may be considered to be combining sites for the attachment of antibodies. The web between the thumb and the index finger may be considered the site of the combining group for anti-Rh₀, the web between the fourth and fifth fingers for anti-Rh^A, and the web between the third and fourth fingers for anti-Rh^B, and the web between the third and index fingers for anti-Rh^C. By definition, all "standard" Rh agglutinogens must have the combining site for anti-Rh₀, but one can conceive of agglutinogens lacking the combining sites for one or more of the antibodies anti-Rh^A, anti-Rh^B, and anti-Rh^C. As already mentioned, most of these possibilities have already been encountered, so that it is reasonable to assume that all eight of the theoretically possible agglutinogens actually exist. In addition to anti-Rh₀, anti-Rh^A, anti-Rh^B, and anti-Rh^C, one may anticipate the existence of four additional antibodies, because there are in all eight possible ways in which antibodies can unite with the three combining sites,

Rh^A, Rh^B, and Rh^C. (The combining site Rh₀ does not enter into the calculations because, by definition, it is shared by all Rh agglutinogens.) The reactions of these four additional postulated antibodies, which may or may not eventually be found, tentatively designated as anti-Rh^D, anti-Rh^E, anti-Rh^F, and anti-Rh^G, are shown diagrammatically in the figure, together with the reactions of anti-Rh^A, anti-Rh^B, and anti-Rh^C.

It is of interest to point out that the four additional postulated antibodies and corresponding blood factors do not increase the number of theoretically possible Rh agglutinogens. The reason for this, as shown in the figure, is that blood factor Rh^D is present when and only when the two factors Rh^A and Rh^B occur in the Rh agglutininogen. Similarly, Rh^E is present when and only when factors Rh^A and Rh^C are both present; Rh^F is present when and only when factors Rh^B and Rh^C are both present; and Rh^G is present when and only when all three factors Rh^A, Rh^B, and Rh^C are present. This kind of situation has been encountered previously in the case of the Rh-Hr blood types and also in studies on agglutinogens or phenogroups in animals and bacteria. For example, factor hr occurs when and only when both factors hr' and hr'' are present,⁸ and factor rh_i bears a similar relationship to the blood factors rh' and rh''.⁹ One may therefore anticipate the existence of two additional Rh-Hr factors, namely, rh, dependent on the simultaneous presence of factors rh' and rh'', and rh_{ii}, dependent on the simultaneous presence of factors rh'' and hr'. In cattle blood group studies,¹⁰ the outline of the human hand helps one visualize such blood factor combinations as BGK and in *Salmonella* typing such combinations as serologic factors as enx.

Irwin and Cumley¹¹ and Irwin and Cole¹² have reported the appearance of so-called hybrid substances in the blood cells of crosses between pigeons and/or doves of different species. This effect, ascribed to gene interaction, can be explained on the serologic level with the aid of a diagram, such as the one shown here. An explanation very similar to the one proposed here has in fact been discussed by other investigators, notably Miller,¹³ who wrote as follows: "One might assume that nothing new is produced except a different physical position (a new propinquity) of the antigens on the erythrocytes of the hybrid, which in the animal immunized stimulates or permits the antibodies to be formed against the combination, resulting in a new specificity of some of the antibodies." As is well known, a similar phenomenon occurs in the case of colors: where two colors overlap a new color may result, e. g., fusion of red and yellow produces orange, while fusion of blue and yellow produces green.

Terminology

With regard to the terminology for the newly discovered and predicted Rh antibodies, the symbols used here and shown in the figure are not to be considered definitive or final. The main shortcoming of the symbols is that they fail to take into account the different levels of the various blood factors and, therefore, do not allow for expansion of the terminology when additional factors are found. This is readily corrected by taking into account the fact

the derived blood factors remain self-explanatory. As for the symbols for the genes and agglutininogens all that is necessary is to add a small letter, such as a, b, and c, to indicate which of the primary blood factors is lacking from the agglutininogen. Since almost all Rh-positive bloods have all the associated blood factors Rh^A, Rh^B, Rh^C, etc., as well as Rh₀, special complex symbols are needed only for the exceptional bloods having Rh agglutininogen lacking one or more of the primary blood factor

Genes	Agglutinogens	Observed Serums & Corresponding Blood Factors				Predicted Serums & Corresponding Blood Factors				Remarks
		Anti-Rh ₀	Anti-Rh ^A	Anti-Rh ^B	Anti-Rh ^C	Anti-Rh ^D	Anti-Rh ^E	Anti-Rh ^F	Anti-Rh ^G	
R ^{abc}	Rh ^{abc}	+	○	○	○	○	○	○	○	All Rh agglutinogens by definition have blood factor Rh ₀
R ^{bc}	Rh ^{bc}	+	+	○	○	○	○	○	○	
R ^{ac}	Rh ^{ac}	+	○	+	○	○	○	○	○	
R ^{ab}	Rh ^{ab}	+	○	○	+	○	○	○	○	
R ^c	Rh ^c	+	+	+	○	+	○	○	○	Rh ^D is present when and only when Rh ^A & Rh ^B are present
R ^b	Rh ^b	+	+	○	+	○	+	○	○	Rh ^E is present when and only when Rh ^A & Rh ^C are present
R ^a	Rh ^a	+	○	+	+	○	○	+	○	Rh ^F is present when and only when Rh ^B & Rh ^C are present
R	Rh	+	+	+	+	+	+	+	+	Rh ^D is present when and only when Rh ^A , Rh ^B & Rh ^C are present

Diagrammatic representation of reactions of anti-Rh₀ and associated antibodies. Rh^{abc}=Rh agglutininogen lacking factors Rh^A, Rh^B, and Rh^C. Rh^{bc}=Rh agglutininogen lacking factors Rh^A and Rh^C. Rh^{ac}=agglutininogen lacking factors Rh^A and Rh^B; and Rh^{ab}=agglutininogen lacking factors Rh^B and Rh^C. Rh^c=agglutininogen lacking factors Rh^A and Rh^B; Rh^b=agglutininogen lacking factors Rh^A and Rh^C; and Rh^a=agglutininogen lacking factors Rh^B and Rh^C. Rh^D, Rh^E, Rh^F, and Rh^G are secondary or derived blood factors. Therefore, if, instead of the symbols Rh^D, Rh^E, Rh^F, and Rh^G, one used the symbols Rh^[AB], Rh^[AC], Rh^[BC] and Rh^[ABC], this difficulty could be overcome. Then, when additional related primary blood factors are found, they can be assigned the symbols Rh^D, Rh^E, Rh^F, Rh^G, etc., in rotation, while the symbols for

that Rh^A, Rh^B, and Rh^C are primary blood factors while the postulated factors Rh^D, Rh^E, Rh^F, and Rh^G are secondary or derived blood factors. Therefore, if, instead of the symbols Rh^D, Rh^E, Rh^F, and Rh^G, one used the symbols Rh^[AB], Rh^[AC], Rh^[BC] and Rh^[ABC], this difficulty could be overcome. Then, when additional related primary blood factors are found, they can be assigned the symbols Rh^D, Rh^E, Rh^F, Rh^G, etc., in rotation, while the symbols for

(Similarly, such expressions as "blind man" and "one-armed man" are used, but the normal man is assumed to have all his limbs and faculties. It will be noticed, moreover, that factors Rh^D, Rh^E, Rh^F, and Rh^G are not indicated in the symbols for genes and agglutinogens, because the presence or absence of these four factors is determined once it is known which of the factors Rh^A, Rh^B, and Rh^C is present.

The serologic reactions of the Rh-Hr antisera identified to date indicate that the Rh-Hr agglutino-gen molecule could have two major side chains or combining sites. The fact that Rh-positive red blood cells can be coated or blocked with Rh₀ blocking antibody without interfering with the reactions of sera of specificities anti-rh', anti-rh'', etc., indicates that the presence or absence of Rh₀ factor, and presumably also the associated factors Rh^a, Rh^b, Rh^c, etc., is determined by one of these two side chains. Moreover, the overlapping relationships between factor hr and factors hr' and hr'', and between factor rh₁ and factors rh' and rh'', etc., indicate that the second postulated side chain probably determines the presence or absence of the blood factor pairs rh'-hr', rh''-hr'', etc.

Summary

Blood factors Rh^a, Rh^b, and Rh^c occur associated with blood factor Rh₀ in Rh-positive blood. Occasionally, Rh-positive persons exist with blood lacking one or more of the factors Rh^a, Rh^b, and Rh^c and can become sensitized to the missing factor or factors, with resulting hemolytic transfusion reactions or infants with erythroblastosis. These cases produce the seeming paradox of an Rh₀-positive person with antibodies in his serum seemingly identical with anti-Rh₀ in specificity. Knowledge of the existence of blood factors Rh^a, Rh^b, and Rh^c will, therefore, aid the clinician in solving certain puzzling clinical problems relating to blood transfusion reactions and erythroblastosis fetalis.

With the aid of diagrams to help visualize the nature of the reactions of anti-Rh^a, anti-Rh^b, and anti-Rh^c, it is possible to anticipate the discovery of hitherto undescribed antibodies and blood factors. The diagrams also aid in clarifying certain previously observed relationships among blood factors in the Rh-Hr system, as well as in studies on the B and C blood group systems in cattle, serotyping of Salmonella bacteria, and the problem of so-called hybrid factors in the red blood cells of crosses between different species of pigeons and doves.

The Rh-Hr agglutino-gen molecule of human blood might have two major side chains or combining sites, one for anti-Rh₀ and the associated antibodies anti-Rh^a, anti-Rh^b, and anti-Rh^c and the other for antibodies against the factor pairs rh' and hr', rh'' and hr'', and the related blood factors hr, rh₁, etc.

Addendum

After this article was prepared, our attention was called to an early report of Shapiro,¹⁴ in which a person was described whose red blood cells were clumped by four out of eight potent anti-Rh₀ se-

rum and whose serum contained a potent Rh₀ antibody (titer 512), which, however, did not react with Rh₀ variant cells. Apparently, Shapiro was dealing with a phenomenon similar or related to the one described in this paper as well as in subsequent investigations, notably, those by Argall and co-workers⁵ and Rosenfield and associates.⁶

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RADICAL PERINEAL PROSTATECTOMY FOR EARLY CANCER

FOLLOW-UP STUDY OF ONE HUNDRED EIGHT PERSONAL CASES

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Accurate follow-up studies are essential in the evaluation of the ultimate results of any surgical procedure. The subsequent course of every patient subjected to a particular operation should be followed as accurately as possible by means of check-up examinations at regular intervals, if possible, or, if this is not practical, regular reports from the patient's personal physician and the results of post-mortem examinations in such patients who later die. It is always impossible to fulfill all these ideals, but in any event every attempt should be made at least to approximate them as accurately as possible.

In no field of surgery is an accurate knowledge of the postoperative course of patients subjected to operative procedures more valuable than in the field of malignant disease. The well-known biological variation in the growth of neoplasms and the vagaries of host resistance offer many difficulties in understanding the life history of these diseases, and many blind spots indeed are present in our knowledge to date. Definite progress in our understanding of these diseases and an accurate evaluation of the ultimate results of surgical procedures can be attained only by studies, as thorough as possible, of the subsequent course of patients subjected to operation. In these studies attempts should be made to correlate the life of the individual after surgical procedures with the type of tumor and its biological characteristics, although we know little about this latter phase.

It is well recognized today, after many years of doubt on the part of some surgeons, that in cancer of the prostate, if the clinical findings suggest that complete eradication of the neoplasm can be accomplished by a surgical operation, such a procedure should be carried out. Unfortunately, the progress of prostatic carcinoma is a slow and insidious one, as is well known, and symptoms from a neoplasm usually do not occur until the growth has progressed beyond the capsule of the gland, making a complete eradication of the disease impossible. However, the attention of the medical profession recently has been directed to early detection of this disease. In the early stages, of course, the diagnosis depends entirely on rectal palpation and on the detection of a nodule or an area of third degree induration. If other factors which might lead to such a finding, such as prostatic calculi, infarction, or an area of chronic prostatitis, can be definitely eliminated, then active steps to insure the diagnosis and to complete eradication of the neoplasm should be instituted.

The course of patients who underwent radical operations for prostatic carcinoma was followed for at least 10 years in 108 cases. In this series there was no operative mortality, but the operation is not free from danger, and there were 10 cases of lasting post-operative incontinence. Of 15 patients who underwent radical perineal prostatectomy before 1947, 7 were living and well 10 years later. Their expectancy of life after operation was therefore little different from that of normal men at age 70.

Methods for Detection of Prostatic Carcinoma

In the literature it is usually stated that only 5% of prostatic carcinomas are recognized in such an early stage that the radical operation is technically feasible. However, in a series of patients studied at the Brady Urological Institute over a two-year period, it was found that 22% of all those given a diagnosis of prostatic cancer were found suitable for the radical operation.¹ This higher figure is undoubtedly due to the fact that many cases of suspected nodules in the prostate have been referred for the express purpose of radical extirpation. In Kimbrough's statistics at the Walter Reed Hospital, this figure is approximately 50%, which can be explained by the fact that all Army personnel over the age of 40 are annually subjected to a rectal examination.²

Numerous studies for the evaluation of the Papanicolaou stain of expressed prostatic secretion have been reported, but the consensus of findings would indicate that on account of the difficulties of interpretation, this procedure is of no value. In addition, the active manipulation of a suspected malignant area, as is necessary to obtain secretion for examination, would certainly be a questionable procedure, as numerous experiments on animal tumors in the past have proved that by massage of these experimental tumors activity in metastatic deposits is greatly accelerated.³

Examination of specimens obtained by transurethral resection is often of conclusive value, but it must be remembered that in early cases of prostatic cancer the lesion is often located in the posterior capsule, and unless very deep cuts of the tissue have been made the presence of the lesion would be missed. Perineal biopsy, usually with the Silverman needle, has many advocates, but here again the small size of the specimen obtained for microscopic examination and the possibility that the particular

From the Brady Urological Institute, the Johns Hopkins Hospital.
Read before the Southeastern Section of the American Urological Association, Jan. 13, 1958.

area which is under suspicion might be missed by the needle counts against the accuracy of this procedure. In the recent literature several reports of implantation of tumor tissue after needle biopsy in various organs have been recorded, and Clarke and associates⁴ have recorded a case in which tumor cells were seeded along the needle tract in the perineum.

Transrectal biopsy, in which a sizable piece of tissue can be obtained from any suspected area in the posterior capsule of the prostate by exposure through an incision in the rectal wall, has been recently proposed.⁵ If such a procedure is solely for diagnostic purposes, accurate information as to the nature of the suspected lesion should be obtained by this method; but, if the diagnostic procedure is to be followed by the radical operation, violation of the integrity of the rectal wall should certainly be severely criticized on account of the fact that the radical operation might easily lead to a rectourethral fistula through this weakened area.

It is our belief that the most accurate information can be obtained by perineal exposure of the gland and excision of the suspected area in the posterior capsule. Frozen-section examination of the excised tissue then gives us the most accurate method for the diagnosis of prostatic neoplasm. At the same time it has been our custom to obtain tissue from the opposite side of the capsule, and examination of this tissue is important in evaluating the extension of the neoplasm, should it be present. When a suspected nodule is present in the prostatic capsule, it is our belief that the prostate should be exposed perineally, frozen section biopsy specimen obtained and, if results are positive for carcinoma, the radical operation should be forthwith carried out. Culp⁶ has clearly stated the problem as follows:

It has been axiomatic that precise diagnosis is a prerequisite of rational therapeutics. Many ingenious techniques have been devised for histologic study of palpable nodules in the prostate, but only perineal exposure of the gland affords direct access to the entire posterior lamella. Biopsy via this route, therefore, should have the greatest potential for indicating unequivocally cases suitable for the radical operation. The combination of frozen section examination and perineal prostatectomy of appropriate type has no parallel in other diagnostic or therapeutic schemes.

The patient is, of course, informed of the procedure to be undertaken and also acquainted with the fact that if the radical operation is carried out sex function will in all probability be abolished. However, before the radical operation should be considered, certain criteria, which have been emphasized before,⁷ should be fulfilled. On palpation the lesion should be limited, as far as one can determine, to the gland itself, and no extension through the capsule should be present. There should be no evident infiltration of the base of the bladder, and the seminal vesicles and the gland should be freely movable. Of course, there should be no evidence, either clinically or roentgenologically, of metastasis, and the serum acid phosphatase level should be normal; but, in our opinion, the most important

point lies in the fact that the patient should be in excellent general condition and have a good life expectancy. It is my belief that radical operations carried out on early lesions in patients above the age of 70 are rarely justifiable, although dogmatic rules cannot be laid down on this point, because of the well-known fact that growth of prostatic carcinoma in the aged is a slow process. Every urologist is, of course, familiar with patients not subjected to operation who have lived for five or more years.

Postoperative Results—from the Literature

There are few studies of late postoperative results of radical operations for early carcinoma of the prostate in the literature. As Jewett⁸ has emphasized, 5-year follow-up studies are of little value on account of the well-known slow growth of the usual prostatic neoplasm, so that to determine accurately the ultimate results of radical procedures, a 10-year follow-up gives us the most important information that we can obtain as to the ultimate evaluation of the particular surgical procedure instituted. It has been only in the last decade that the retropubic radical operation has been used, so that no 10-year follow-up studies on this procedure are as yet available.

Flocks' studies will be awaited by urologists with great anticipation. He combines radical retropubic prostatectomy with the injection of radioactive gold along the lymph channels and the nodes which drain the prostate gland. In addition, he has been treating patients with inoperable cancer by injection of radioactive gold into the growth itself and into the lymph channels and nodes. When a 10-year evaluation of these studies is available, it may be that valuable information will be obtained as to the results of this therapy.

Jewett has analyzed the results of 401 radical operations for the eradication of early carcinoma of the prostate which have been carried out at the Johns Hopkins Hospital. The technique in all cases has been that proposed by Young⁹ in 1904, with a few minor modifications, principally in the placing of the sutures which anastomose the stump of the urethra to the defect in the bladder which occurs after the radical operation. He has emphasized the fact that when the neoplasm is microscopically contained within the prostatic capsule the prognosis as to longevity is far better than when examination of the operative specimen shows extension through the capsule or into the seminal vesicles. The 10-year survival rate of these patients with a favorable prognosis, that is, no extension into the capsule, is approximately 50%, which closely approximates the expected survival rate for men of the same age group in the general population.

Turner and Belt¹⁰ have reported a series of 274 patients subjected to radical perineal prostatectomy. In the pathological specimens of 39 of these patients, no evidence of malignancy could be found. The mortality in this series was 3.9%. Sixty of the patients subjected to operation were over the age

of 70 and 15 over the age of 80. The 10-year survival rate of these patients was 47%, which is approximately the same as that found in Jewett's studies.

Barnes¹¹ has made a very valuable contribution in the study of palliative treatment of early carcinoma of the prostate. Thirty-one patients with

TABLE 1.—Analysis of Results, on Yearly Basis, in 108 Patients Who Had Radical Perineal Prostatectomy for Cancer

Year of Operation	Living, No.		Died, No.	
	No Recurrence	Recurrence	Recurrence	Other Causes
1957.....	8	2	2	3
1956.....	3	3	3	5
1955.....	3	2	4	1
1954.....	0	2	3	1
1953.....	4	..	2	1
1952.....	4	3	2	2
1951.....	6	2	2	1
1950.....	5	2	2	2
1949.....	3	1	..	..
1948.....	1	..	1	..
1947.....	..	..	1	1
1946.....	3	1	1	..
1945.....	..	2	..	..
1944.....	1	1	..	..
1943.....	2	..	1	..
Total*.....	43	22	24	17

* Two of the 108 patients showed no evidence of carcinoma at operation.

Early carcinoma of the gland were considered to be amenable for the radical operation. These patients of cervical with estrogens, and a 5-year survival disease. An approach (which is very close to the therefore be improperly patients subjected to the ing to classifications of Craver²) and survival rate was sive local therapy. This is particularly una of the as the patient's reserve may be needlessly depleted while a potentially more serious site progresses unchecked. The moderately aggressive management of class 2 cases with beginning spread but still showing regional distribution of lesions must also be considerably modified if generalized disease can

was then reopened and the radical operation carried out without incident. This patient has remained well to date, eight years after the operation.

Tables 1 and 2 show an analysis of the series on a yearly basis. It will be noted that 14 patients operated on in 1953 through 1957 died with recurrence and/or metastases. This high mortality probably means that in these particular cases the growth was biologically very active or the host resistance lowered. After the first 5 years the incidence of death from the disease progressively diminished, and if a patient has survived 10 years his chances of death from carcinoma are minimal.

Of the 40 patients operated on in the period 1948-1952, 19 (approximately 50%) are living with no known recurrence or metastases. These are patients who have survived five years or more since the operation, and, of course, not included in this series are the patients who died in the first five years after operation. As has been mentioned above, those patients who have harbored a biologically active neoplasm will usually die within the first few years.

Fifteen patients were subjected to radical perineal prostatectomy before 1947. Seven (about 50%) of these are living and well to date (one 10 years, three 12 years, one 14 years, and two 15 years) with no clinical evidence of recurrence or metastases. Four are living with recurrence and/or metastases, three have died with recurrence and/or metastases, and one has died of other causes. These statistics, it will be seen, are in close agreement with the 10-year survival statistics of Jewett and of Belt.

Both patient basis and re Comments perineal prostatectomy general anesthesia. There has been no significant morbidity in over 200 examinations.

There have been no instances of serious operative or postoperative hemorrhage, and the irrigation through the catheter when the operation has been completed has usually been quite clear. As has been emphasized before, patients subjected to the radical operation are usually in good physical condition, which plays no small part in the usual simple operative and postoperative course, whereas many patients whose general health has been impaired by various causes are subjected to a perineal prostatectomy for benign hypertrophy. In fact, it has been our impression that perineal prostatectomy is the safest operation for poor risk patients with very large glands, so that in this particular group, usually well-advanced in years, postoperative complications are far more frequent than in the patients subjected to the radical operation.

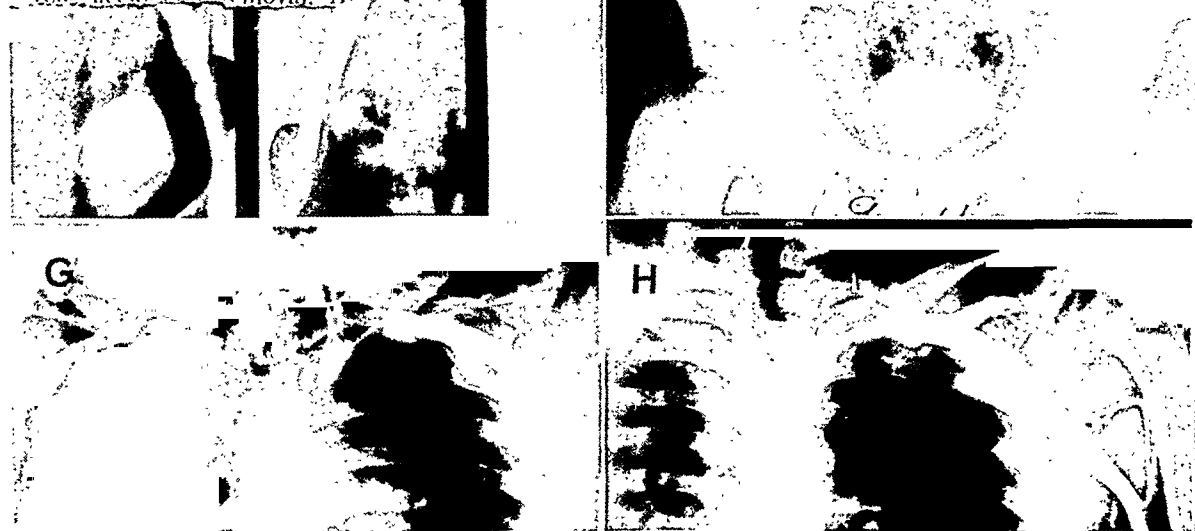
The Foley catheter, which is introduced at the time of operation, is allowed to remain in the bladder for approximately 10 days, at which time the perineal incision is usually completely healed. Accidental removal of the catheter during this time is especially dangerous. In two patients the catheter was extruded as a result of accidental deflation of the bag. In attempts to reintroduce the catheter, extravasation occurred in two cases, in one of which peritonitis, necessitating laparotomy, developed. Therefore, to be sure that the catheter remains for the necessary time, it has been our custom not to rely entirely on the bag but to pass a small silk suture through the glans and tie it around the catheter. This gives an additional safeguard against accidental removal. After

ing the postoperative course. This is usually manifested by difficult urination, a thin, weak stream, and dribbling. If these signs become apparent, dilatation of the operative site, carefully carried out, preferably with filiforms and followers, will often result not only in great improvement of the urinary stream but in disappearance of the incontinence.

During the first two or three months after operation, it has been my custom to give small doses of estrogens. This treatment is instituted entirely on an empirical basis in the belief that, if neoplastic cells remain behind after the operation, estrogen therapy might result in their necrosis. I have felt that there is no necessity for continuing estrogen therapy after a brief interval of time. When recurrence and/or metastasis is evident, estrogen therapy is commenced. When this treatment is no longer effective, a bilateral orchiectomy is carried out, and in the later stages of widespread disease cortisone therapy is often very effective in prolonging life and relieving pain.

Summary

The postoperative course and follow-up studies on 108 patients subjected to radical perineal prostatectomy have been analyzed. There has been no operative mortality in this series. Perineal and frozen section biopsy were found to be superior to other methods of diagnosis. Survival rates were



A, normal inferior vena cavagram. Note widening of vena cava at level of renal pedicle. B, posteroanterior roentgenograms of chest in patient with mediastinal, hilar, and parenchymal involvement by reticulum cell sarcoma; no clinical evidence of intra-abdominal disease. C, inferior vena cavagram of same patient with encroachment on and lateral displacement of this thin-walled structure by large retroperitoneal mass at L-1-L-2 level; lateral view illustrates anterior displacement. Large right inguinal and femoral mass of nodes seen on physical examination of patient given histological diagnosis of lymphosarcoma; small left inguinal and left cervical nodes were present, but no abdominal or pelvic disease could be palpated. Inferior vena cava (D) is markedly displaced to left by large mass extending superiorly to L-3. Bladder and right ureter are also displaced in pelvis. After radiation therapy (E and F), normal anatomic relationships of these structures are noted. G, superior vena cavagram of patient given diagnosis of Hodgkins' disease by scalene node biopsy revealed complete obstruction of left innominate vein with obvious collateral circulation. Note large mediastinal and mass. In view of normal inferior vena cavagram and absence of peripheral lymphadenopathy, intensive regional therapy was elected. After 3,500 r to mediastinum, repeat superior vena cavagram (H) revealed slight alteration in innominate vein which was now patent. Note absence of collaterals and disappearance of mediastinal mass.

of 70 and 15 over the age of 80. The 10-year survival rate of these patients was 47%, which is approximately the same as that found in Jewett's studies.

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Total*.....	43	22	24	17

* Two of the 108 patients showed no evidence of carcinoma at operation.

early carcinoma of the gland were considered to be favorable for the radical operation. These patients were treated with estrogens, and a 5-year survival rate of 53% was noted (which is very close to the 5-year survival rate of patients subjected to the radical operation); but his 10-year survival rate was 22%. This series gives us an excellent study of the comparative results of estrogen therapy and radical perineal prostatectomy in early cases of prostatic cancer.

Analysis of Results in Present Study

In the hope that a study of a personal series of patients with radical perineal prostatectomy for early cancer of the prostate would add additional information, an analysis of 108 cases of my own has been carried out. The evaluation of the ultimate results has been carried out by two members of the house staff of the Brady Urological Institute in the hope that the factor of optimism, which is so liable to be present in the presentation of any personal series, might be excluded.

A total of 108 cases, with sufficient follow-up, have been analyzed. There has been no operative mortality in this series. Forty-three patients are living and well without known recurrence or metastases, 22 are living with recurrence and/or metastases, 24 have died with recurrence and/or metastases, and 17 have died from other causes. In two cases examination of the pathological specimen showed no evidence of carcinoma.

The operations on these patients were carried out over 10 years ago, before the practice of obtaining frozen section biopsy specimens in all cases was instituted. In one case the result of frozen section biopsy was reported negative for carcinoma, but when the permanent sections were studied evidences of malignant disease were demonstrated five days after the perineal exposure for biopsy. The wound

was then reopened and the radical operation carried out without incident. This patient has remained well to date, eight years after the operation.

Tables 1 and 2 show an analysis of the series on a yearly basis. It will be noted that 14 patients operated on in 1953 through 1957 died with recurrence and/or metastases. This high mortality probably means that in these particular cases the growth was biologically very active or the host resistance lowered. After the first 5 years the incidence of death from the disease progressively diminished, and if a patient has survived 10 years his chances of death from carcinoma are minimal.

Of the 40 patients operated on in the period 1948-1952, 19 (approximately 50%) are living with no known recurrence or metastases. These are patients who have survived five years or more since the operation, and, of course, not included in this series are the patients who died in the first five years after operation. As has been mentioned above, those patients who have harbored a biologically active neoplasm will usually die within the first few years.

Fifteen patients were subjected to radical perineal prostatectomy before 1947. Seven (about 50%) of these are living and well to date (one 10 years, three 12 years, one 14 years, and two 15 years) with no clinical evidence of recurrence or metastases. Four are living with recurrence and/or metastases, three have died with recurrence and/or metastases, and one has died of other causes. These statistics, it will be seen, are in close agreement with the 10-year survival statistics of Jewett and of Belt.

Comment

Some physicians, unfamiliar with the radical operation, undoubtedly have a false concept of its dangers. In this series there was no incidence of rectal injury or of rectourethral fistula; there were 10 instances of incontinence, 2 of extravasation after postoperative instrumentation, 1 of peritonitis necessitating laparotomy, 2 of suprapubic cystostomy for postoperative obstruction, and 1 of transurethral resection for postoperative stricture. Blood loss at the time of operation is usually less than during a

TABLE 2.—Summary, for Five-Year Intervals, of Data in Table 1

Year of Operation	Living* No.		Died,* No.		Total
	No Recurrence	Recurrence	Recurrence	Other Causes	
1953-1957.....	18	10	14	11	53
1948-1952.....	19	9†	7	5	40
1943-1947.....	7†	4	3	1	15
Total.....	44	23	24	17	108

* As of Dec. 31, 1957.

† Of the two patients showing no evidence of carcinoma at operation, one now shows evidence and one no evidence.

perineal prostatectomy for benign adenoma. This is due to the fact that when the lateral ligaments have been tied, the source of serious bleeding is controlled, and serious bleeding from the area in the bladder wall is always controlled by the sutures which are used to complete the anastomosis and to complete the defect in the bladder wall.

There have been no instances of serious operative or postoperative hemorrhage, and the irrigation through the catheter when the operation has been completed has usually been quite clear. As has been emphasized before, patients subjected to the radical operation are usually in good physical condition, which plays no small part in the usual simple operative and postoperative course, whereas many patients whose general health has been impaired by various causes are subjected to a perineal prostatectomy for benign hypertrophy. In fact, it has been our impression that perineal prostatectomy is the safest operation for poor risk patients with very large glands, so that in this particular group, usually well-advanced in years, postoperative complications are far more frequent than in the patients subjected to the radical operation.

The Foley catheter, which is introduced at the time of operation, is allowed to remain in the bladder for approximately 10 days, at which time the perineal incision is usually completely healed. Accidental removal of the catheter during this time is especially dangerous. In two patients the catheter was extruded as a result of accidental deflation of the bag. In attempts to reintroduce the catheter, extravasation occurred in two cases, in one of which peritonitis, necessitating laparotomy, developed. Therefore, to be sure that the catheter remains for the necessary time, it has been our custom not to rely entirely on the bag but to pass a small silk suture through the glans and tie it around the catheter. This gives an additional safeguard to prevent accidental removal. After the catheter had been removed, in two patients, postoperative retention developed. All efforts to reintroduce the catheter failed. In these patients suprapubic cystotomy was necessary, and the catheter was easily replaced, with no other complications.

It has been my custom, in completing the anastomosis of the stump of the urethra to the neck of the bladder, to use a modification of the Vest suture. In this method the ends of the suture are passed out through the perineal muscles and fat and tied there so that the stump of the urethra is brought up to the neck of the bladder snugly and no knots are tied through the urethral stump, which contains the muscles of the external sphincter. In my opinion this simple suture has been a potent factor in reducing our incidence of incontinence.

In this series we have defined as incontinent any individual who is forced to wear some form of apparatus. Some degree of incontinence always persists for varying intervals of time after the radical operation. In most cases, however, the control has been regained before the patient is discharged from the hospital, but in a few cases several weeks or even months elapse before the sphincter tone returns to normal. In 10 patients in this series, however, the necessity for wearing some protective device persisted for one year, and these patients were classified as being totally incontinent. Constriction at the site of the operation may occur sometime dur-

ing the postoperative course. This is usually manifested by difficult urination, a thin, weak stream, and dribbling. If these signs become apparent, dilatation of the operative site, carefully carried out, preferably with filiforms and followers, will often result not only in great improvement of the urinary stream but in disappearance of the incontinence.

During the first two or three months after operation, it has been my custom to give small doses of estrogens. This treatment is instituted entirely on an empirical basis in the belief that, if neoplastic cells remain behind after the operation, estrogen therapy might result in their necrosis. I have felt that there is no necessity for continuing estrogen therapy after a brief interval of time. When recurrence and/or metastasis is evident, estrogen therapy is commenced. When this treatment is no longer effective, a bilateral orchiectomy is carried out, and in the later stages of widespread disease cortisone therapy is often very effective in prolonging life and relieving pain.

Summary

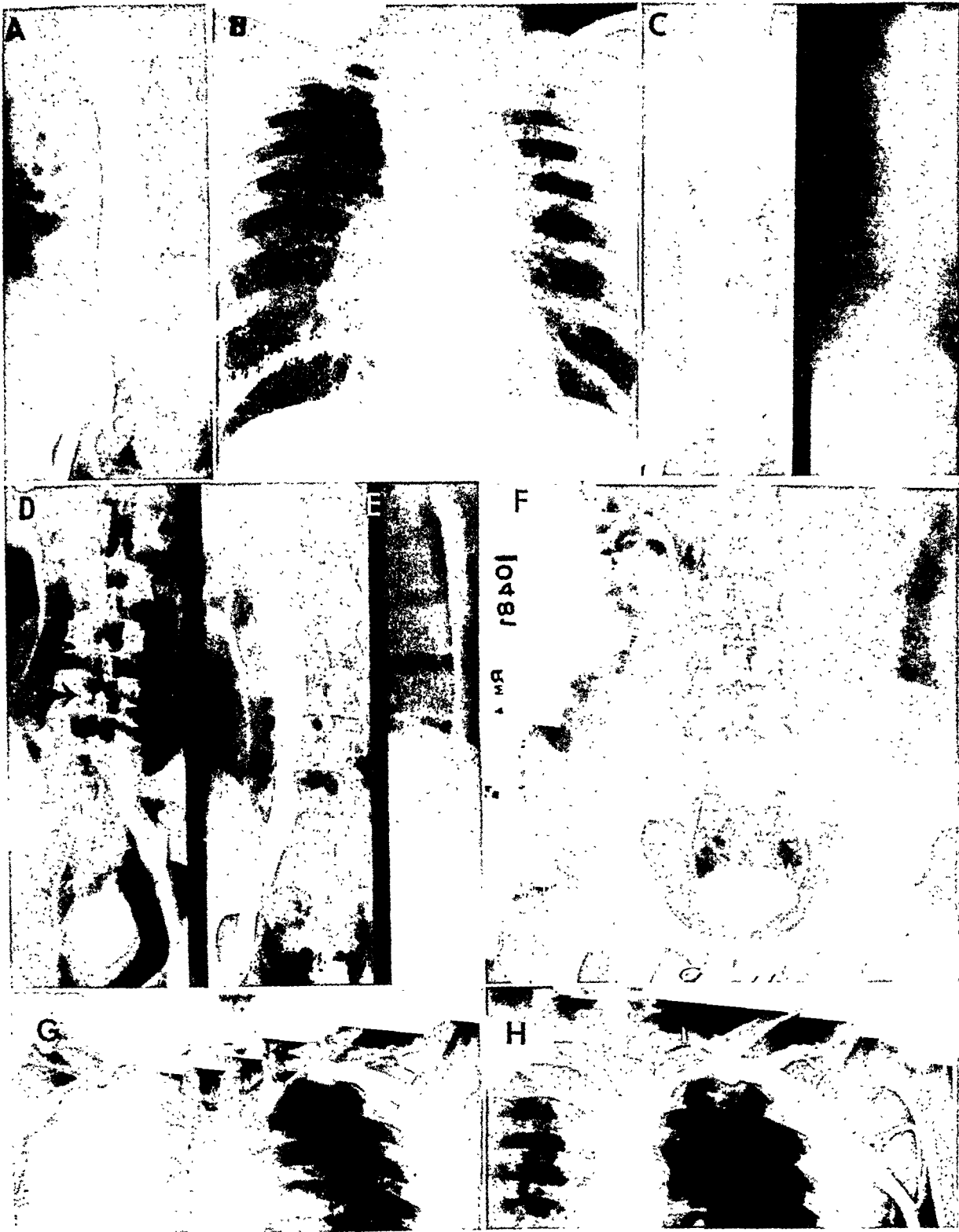
The postoperative course and follow-up studies on 108 patients subjected to radical perineal prostatectomy have been analyzed. There has been no operative mortality in this series. Perineal exposure and frozen section biopsy were found to be superior to other methods of early diagnosis. The 10-year survival rate in this series is 47%, which closely approximates the life expectancy in normal individuals in this age group.

601 N. Broadway (5).

Drs. John A. C. Colston Jr. and Frank D. Hill abstracted the histories and follow-up records of the patients in this series.

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A, normal inferior vena cavagram. Note widening of vena cava at level of renal pedicle. B, posteroanterior roentgenograms of chest in patient with mediastinal, hilar, and parenchymal involvement by reticulum cell sarcoma; no clinical evidence of intra-abdominal disease. C, inferior vena cavagram of same patient with encroachment on and lateral displacement of this thin-walled structure by large retroperitoneal mass at L-1-L-2 level; lateral view illustrates anterior displacement. Large right inguinal and femoral mass of nodes seen on physical examination of patient given histological diagnosis of lymphosarcoma; small left inguinal and left cervical nodes were present, but no abdominal or pelvic disease could be palpated. Inferior vena cava (D) is markedly displaced to left by large mass extending superiorly to L-3. Bladder and right ureter are also displaced in pelvis. After radiation therapy (E and F), normal anatomic relationships of these structures are noted. G, superior vena cavagram of patient given diagnosis of Hodgkins' disease by scalene node biopsy revealed complete obstruction of left innominate vein with obvious collateral circulation. Note large mediastinal and left hilar mass. In view of normal inferior vena cavagram and absence of peripheral lymphadenopathy, intensive regional radiotherapy was elected. After 3,500 r to mediastinum, repeat superior vena cavagram (H) revealed slight alteration in course of left innominate vein which was now patent. Note absence of collaterals and disappearance of mediastinal mass.

CLINICAL NOTES

CONTRAST VISUALIZATION OF THE VENAE CAVAE IN MANAGEMENT OF LYMPHOMA

Lieut. Billy P. Sammons, Lieut. Ronald R. Lund, Lieut. William O. Pischnotte

and

Capt. Charles Gartenlaub, (MC), U. S. N.

The most important factor in estimating the prognosis and choosing the treatment of histologically proved malignant lymphoma is the clinical extent of the disease.¹ This is determined by the symptom complex, physical findings, laboratory studies, and roentgenographic examinations.

A considerable number of patients are encountered in whom only localized evidence of disease is apparent by these studies. In many of these patients the disease is already disseminated. Thus, extensive silent intra-abdominal disease may be present with only satellite inguinal or femoral nodes early evident. The same relationship is often true of cervicobasilar and axillary nodes with intrathoracic disease. An apparent unicentric lymphoma may therefore be improperly staged as class 1 (according to classifications of Craver²) and receive intensive local therapy. This is particularly undesirable as the patient's reserve may be needlessly depleted while a potentially more serious site progresses unchecked. The moderately aggressive management of class 2 cases with beginning spread but still showing regional distribution of lesions must also be considerably modified if generalized disease can be demonstrated.

Techniques available for the detection of disease in the deep-seated lymph nodes consist of routine and tomographic chest roentgenograms, gastrointestinal studies, and intravenous pyelography. Although these techniques are of established value in the detection of large mediastinal and intra-abdominal masses, a more sensitive method is required to detect smaller foci. Particularly in evaluating the extensive retroperitoneal space is a simple and dependable method needed.

This problem has been partially overcome through the use of contrast visualization of the superior and inferior venae cavae. These studies have been included in the routine examination of all lymphoma cases seen in the past two years at U. S. Naval Hospital, St. Albans, N. Y., and have been found to be of significant value in formulating a plan of therapy and evaluating the results.

Technique

The inferior vena cavagram is performed by the injection of 30 cc. of a 50% solution of sodium diatrizoate (Hypaque) through a 17-gauge needle

inserted percutaneously into the right femoral vein. The left femoral vein is occluded during the injection. A transabdominal lateral film is obtained with the first injection. A second injection for the anteroposterior film demonstrates the urinary tracts and the inferior vena cava, permitting better evaluation of the retroperitoneal space. Further details of this technique have been described in another publication.³

The superior vena cavagram is performed by injecting 30 cc. of a 50% solution of sodium diatrizoate as rapidly as possible into an antecubital vein through an 18-gauge needle. A single supine film of the chest is exposed at the end of injection by means of a Bucky grid technique. A second film is exposed after a six-second delay to further evaluate the extent of obstruction and collateral circulation. Serial filming is of value in selected cases. Pyelograms are obtained as part of the examination. Both procedures can be performed on an outpatient basis and require neither premedication nor general anesthesia. There has been no significant morbidity in over 200 examinations.

Comment

Forty cases of lymphoma have been studied by these techniques in addition to the routine examinations (see figure). In one-fourth of the cases unsuspected retroperitoneal involvement was demonstrated. In other cases the extent of known intra-abdominal or retroperitoneal disease was shown to be greater than suspected. In cases of cervicomediastinal lymphoma the inferior vena cavagram may confirm the absence of significant abdominal disease and therefore suggest more intensive regional radiotherapy. The superior vena cavagram occasionally demonstrated more severe encroachment on the superior vena cava than was suspected by routine roentgenograms and venous pressures. In these cases the study indicated the need for greater caution in the initial administration of radiotherapy to minimize the risk of sudden complete obstruction.

The comparison of post-therapy vena cavagrams with the initial abnormal studies permits an objective evaluation of the results of treatment. Interval vena cavagrams allow early detection of deep-seated recurrences and should be a routine part of follow-up examinations. The normal vena cavagrams are

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A, normal inferior vena cavagram. Note widening of vena cava at level of renal pedicle. B, posteroanterior roentgenograms of chest in patient with mediastinal, hilar, and parenchymal involvement by reticulum cell sarcoma; no clinical evidence of intra-abdominal disease. C, inferior vena cavagram of same patient with encroachment on and lateral displacement of this thin-walled structure by large retroperitoneal mass at L-1-L-2 level; lateral view illustrates anterior displacement. Large right inguinal and femoral mass of nodes seen on physical examination of patient given histological diagnosis of lymphosarcoma; small left inguinal and left cervical nodes were present, but no abdominal or pelvic disease could be palpated. Inferior vena cava (D) is markedly displaced to left by large mass extending superiorly to L-3. Bladder and right ureter are also displaced in pelvis. After radiation therapy (E and F), normal anatomic relationships of these structures are noted. G, superior vena cavagram of patient given diagnosis of Hodgkins' disease by scalene node biopsy revealed complete obstruction of left innominate vein with obvious collateral circulation. Note large mediastinal and left hilar mass. In view of normal inferior vena cavagram and absence of peripheral lymphadenopathy, intensive regional radiotherapy was elected. After 3,500 r to mediastinum, repeat superior vena cavagram (H) revealed slight alteration in course of left innominate vein which was now patent. Note absence of collaterals and disappearance of mediastinal mass.

equally important. Subsequent alterations from the normal indicate new sites of disease which can be treated before massive involvement has occurred.

Summary

The management of lymphoma patients requires a knowledge of the complete extent of involvement, which can be obtained by the use of a simplified technique of visualizing the superior and inferior venae cavae. Studies have proved themselves invaluable in the detection of deep-seated disease and in the planning and evaluation of therapy.

The views expressed are those of the authors and do not necessarily represent the views of the Bureau of Medicine and Surgery, Navy Department.

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PHANTOM RECTUM—AID IN TEACHING DISEASES OF THE PROSTATE

Sidney R. Weinberg, M.D.

and

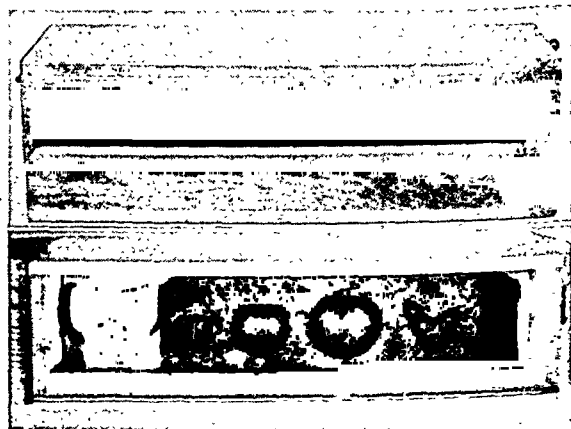
John Hart, Brooklyn, N. Y.

The prostate gland is a deep-seated organ, the spatial relationships of which are complex and difficult to comprehend. Furthermore, the gland cannot be visualized in patients but can only be palpated through the rectum. This examination is unpleasant at best and can be traumatic if improperly performed. The student must be prepared to do rectal examinations properly and efficiently.

In order to orient the student as to the shape, size, and consistency of the prostate, a teaching aid, a phantom rectum, has been devised to provide models of the normal prostate and those altered by disease that can be palpated. These would be available at all times to the medical students as it is often impossible to have access to patients whose prostates have the pathological alterations that are under discussion.

Through the kindness of Dr. B. G. Clark we received casts of the normal and diseased prostate made directly from clinic specimens and transposed into plaster.¹ From these molds resilient copies were prepared from a plastic material, the consistency of which is similar to that of the prostate gland. The material used is called Plastiflex. It is a rubber-like, hot melt, casting compound, dispensed as a powder. The powder was put in an open pan and placed in an oven to a controlled heat of 350 to 360 F until it melted. The mixture was then stirred thoroughly and poured into contrast plaster molds that had been previously prepared and waxed. As the material hardened, a rubber-like resilient cast of the prostate formed.

The finished models were then placed into the base of a hinged box with a window cut into its face. This opening was filled with a perforated rubber diaphragm (see figure). The perforations were made to allow students to examine each mold separately with an examining finger and so simulate rectal examination of the prostate. The models include that of the normal prostate, a prostate that was moderately hypertrophied, a prostate greatly hypertrophied, a prostate altered by tuberculous infection, a prostate with a single malignant nodule, and a model of a prostate that was extensively



Top, front view of closed phantom rectum. Bottom, models of normal and diseased prostates placed in phantom rectum.

altered by carcinoma. In order to simulate the so-called stony feel of a prostate with extensive malignancy, this model was prepared from a contrast mold of Plastiflex and the original mold duplicated in plaster.

From the Department of Surgery (Urology) (Dr. Weinberg) and the Office of Maintenance and Engineering (Mr. Hart), State University of New York Downstate Medical Center.

In our first attempt we merely secured the models to the floor of the box by an adhesive, but found that the probing fingers of the students soon loosened the models. Therefore we made a new set of models in which all the molds were held together by strips of Plastiflex and nails were placed through the intervening strips of the plastic to the floor of the box. With this preparation the models remained

in place. We have used these models throughout the teaching year. The students and instructors in the department feel that they are worth the efforts extended.

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TREATMENT OF CHRONIC PELVIC INFLAMMATORY DISEASE WITH MICROWAVES (RADAR)

Alan Rubin, M.D., Philadelphia

The basic treatment of pelvic inflammatory disease, except for the use of antibiotics, has undergone but little alteration since 1857, when Bernutz and Goupil first correctly described the pathology of the disease and gave recommendations for therapy.¹ They suggested treatment by bed rest, laudanum, and the administration of pelvic heat by baths and poultices. At present, diathermy is often employed to produce the pelvic heating, since it is thought to give better penetration of heat than hydrotherapy techniques.

After World War II, and the release of previously secret information on radar, microwaves (radar, ultra-high-frequency electromagnetic waves of extremely short length) began to be used instead of conventional diathermy for the treatment of many conditions.² Among the reported advantages of microwave therapy over conventional diathermy are (1) a better ratio of cutaneous to deeper tissue temperatures, (2) better control of the area of application, and (3) absence of the danger of electric arcs.² Consideration of the physical characteristics of microwaves and the dielectric constants and heat loss tangents of the type of tissues involved suggested that microwaves might be valuable in the treatment of chronic pelvic inflammatory disease. Therefore, microwave therapy has been used 855 times in 165 women with the diagnosis of this disease.

Procedure

One hundred sixty-five patients suffering from chronic pelvic inflammatory disease served as subjects. The duration of their symptoms ranged from three months to eight years. One hundred forty (85%) had previously had one or more types of therapy, such as antibiotics, sulfonamides, hot douches, or Elliott treatments. A total of 855 micro-

wave exposures were given. The clinical course of the patients was followed by the physicians serving in the gynecology outpatient section. To avoid bias in the evaluation of the therapy, neither the patients nor the gynecologists were aware of the fact that a special type of treatment was being employed.

Members of the department of physical medicine administered the microwave therapy. The apparatus has a continuous-wave, oscillating, air-cooled magnetron tube, producing energy at a frequency of 2,450 mc. per second (wave length, 12.25 cm.) and providing a maximum output of 125 watts. The energy is radiated to the body by a hemispherical director 6 in. in diameter. The director was fixed 3 in. from the skin. Eighty per cent (approximately 100 watts) of the maximum output of the machine was directed over the patient's exposed suprapubic region for 15 minutes. Three treatments a week for four weeks, excluding the period of menstruation, was planned as minimum therapy.

Results

One hundred sixty-five women received a total of 855 microwave exposures. The technique of application proved simple. It usually required less than two minutes to position the patient and machine and set the instrument in operation. There were no skin burns or instances where the patient complained of uncomfortable heating effects.

Two patients reported exacerbations of symptoms after therapy. Each experienced an increase in abdominal pain shortly after treatment—in one subject this was after the initial exposure and the other after the second. The therapy of both was discontinued for several weeks. The first patient had an inflammatory adnexal mass 10 cm. in diameter before the institution of treatment. This gradually diminished in size and was no longer palpable after her 13th exposure to microwaves. She became pregnant three months later, and a normal infant

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was born at term. The second patient's therapy was resumed after three weeks. She received eight more treatments, at the end of which time she was completely free of pain and her pelvic induration had disappeared.

Two patients reported a marked increase in menstrual flow during the course of treatment. In addition to the patient mentioned above, one other became pregnant shortly after completing therapy. She was delivered at term of a normal infant.

The degree of pain relief and resolution of pelvic pathology were evaluated in 72 women who received four or more treatments and in whom follow-up studies could be done for 2 to 18 months after therapy. Fifty-six per cent of the 72 patients experienced marked relief of pain. Eleven per cent were moderately improved. Fourteen per cent reported slight improvement. Fifteen per cent experienced no improvement, while 4% considered themselves worse.

Forty-four per cent of the patients were found to be markedly improved on pelvic examination; 32% were thought to be moderately improved; and the pelvic condition of 24% was unchanged.

Comment

Exacerbations of pelvic pain are sometimes encountered when conventional diathermy is used in the treatment of chronic pelvic inflammatory disease. Two of the 165 patients in this series who received microwave therapy reported such an increase in pain. Moreover, microwaves were given in several instances in which the disease might have been considered subacute. For example, two patients who were hospitalized because of a severe

exacerbation of their pelvic inflammatory disease were started on microwave therapy while still in the hospital. Each had been afebrile for only five days before the microwave treatments were begun. Pain, tenderness, and adnexal masses were still significant features of their illness. Both showed considerable resolution of the pelvic findings within less than a week, after bed rest and antibiotics had failed to result in further improvement.

Summary

One hundred sixty-five women suffering from chronic pelvic inflammatory disease received 855 microwave treatments. The technique of application was simple. There were no skin burns. Possible harmful effects included an exacerbation of pain during therapy in 2 of the 165 patients and an increase in menstrual flow in 2.

Seventy-two of the patients who were given four or more treatments were given follow-up examinations for 2 to 18 months after therapy. In this group, pelvic pain was markedly decreased in 56% and moderately decreased in 11%. Four per cent thought they were made worse. Symptomatic relief, in general, paralleled the degree of resolution of pelvic masses and induration.

255 S. 17th St. (3).

The microwave apparatus used in this study was supplied by Raytheon Manufacturing Company, Waltham, Mass.

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NEW TYPE OF DISPOSABLE MINIATURE ENEMA

Philip L. Aries, M.D., Chicago

A new type of disposable pediatric enema which has proved to be safe, effective, and easy to handle is of interest to the practicing pediatrician and general practitioner, particularly since it has caused no undesirable side-effects. This advance in the administration of enemas to children became possible as the result of the development of a plastic device which is discarded after a single use. The mechanism of action of this enema is similar to that of the time-tested glycerin suppository, that is, de-

hydration and sensory irritation of the lower intestine without the production of distention. I have found the product to be more efficient and simple to manipulate than the glycerin suppository.

In general, one might feel that a glycerin suppository was a more desirable form of medication than the conventional enema or a laxative given by mouth because it empties the lower intestine more rapidly and with greater speed and safety. These factors are important, particularly before operation, when the diagnosis may be in question, as well as postoperatively.

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However, this study has shown that the new miniature enema has advantages over the suppository and the conventional enema. The new enema consists of a small plastic reservoir 1.5 in. (3.75 cm.) long containing 1 cc. of fluid. The medication is composed of a stearate in an aqueous glycerinated detergent base. Incorporated in the reservoir is a flexible plastic nozzle 2 in. (5 cm.) long which has a stopper that must be removed before the nozzle is inserted in the rectum. It is best to lubricate the nozzle with a drop of the contents before introducing it. After introduction the contents of the plastic reservoir are squeezed through the nozzle into the rectum. The appliance is then discarded. The formula of the liquid used follows the composition of the U. S. P. formula for a glycerin suppository: infant size, 2 cc. of glycerin, 0.1 cc. of water, and 0.15 Gm. of potassium stearate; adult size, 3 cc. of glycerin, 0.2 cc. of water, and 0.25 Gm. of potassium stearate.

This enema, dispensed in the plastic container described, was used in a series of 20 cases in which it was desirable for the patient to have an intestinal evacuation. Nineteen of the patients were children ranging in age from 9 months to 9 years. One adult, a student nurse, is included in the group.

A 15-month-old baby given a barium enema for diagnostic x-ray study of the colon had still not moved its bowels two days later and had the abdominal discomfort associated with this. Administration of the enema produced a prompt and satisfactory stool elimination. Another child had a bowel movement five minutes after the disposable enema was administered, although he had no results from a saline enema.

The new enema was used with satisfactory results and caused the patient no discomfort in the case of a 5-year-old boy three days after an appendectomy during which time he had passed no stool. He had an adequate evacuation 10 minutes after the enema was given. The nurse reported that this new procedure was more satisfactory than the administration of the conventional enema.

A 26-month-old child, chronically constipated, was given this type of enema every day or two along with an orally administered stool softener in order to initiate a toilet training program. The child had a bowel movement five minutes after the enema was administered. The procedure was beneficial as an auxiliary measure in the psychological approach to the situation. The enemas gave the child no discomfort.

Nurses and parents commented on the ease of administration of this new enema technique. It is not necessary to use the finger or such aids as a thermometer in order to insert the nozzle into the rectum, as is frequently required when a glycerin suppository is used. The mothers who administered the treatment in 7 of the 20 cases, when questioned as to how they thought their children responded, in each instance expressed a favorable opinion.

The student nurse used the enema when it was necessary to obtain a fresh stool specimen for bacteriological study and, in this instance, a satisfactory bowel movement was obtained within 15 minutes. She reported that the enema produced a mild burning sensation, a discomfort which she also experienced when using a glycerin suppository. However, she had less of this discomfort and it did not continue for as long a time when the disposable enema was used as it did when the glycerin suppository was used. In addition, it stopped when the intestine was evacuated about 15 minutes after the enema was given. The enema was also used for the same purpose in the case of a 4-year-old child. This boy had had no bowel movement for a 24-hour period while in the hospital, and an evacuation was obtained 30 minutes after the disposable enema was used. The stool specimens obtained for the laboratory are free of the large amount of water present when a conventional enema is used for the same purpose.

Most of the children were too young to express their reactions to the treatment. Some of the older children offered the opinion that the enema caused no discomfort. None of the children were objectively disturbed and none registered any type of complaint.

The nurse who gave the enemas to the 13 hospitalized patients found the results to be satisfactory in each instance. Another nurse reported that a 4-year-old child suffering from chronic constipation, who fought when given a conventional enema, accepted the disposable enema with no resistance.

Personally, I found this type of enema gave good results in each of the 20 patients to whom it was given. The application of the new device is more convenient than that of a suppository. This miniature enema was also more effective than the suppository and in most instances preferable to the conventional enema. No patient had any untoward results from the use of this enema. There was no evidence of irritation or cramping. No seepage of the medication was noted.

Summary

A new simple plastic device for administering an enema was used for 19 children and 1 adult. The principle is the same as for the time-proved glycerin suppository. This miniature enema is more effective and easier to handle than suppositories, and in most cases preferable to large enemas. No untoward effects followed its use.

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This study was conducted under a grant from the New Drug Institute, New York City, on behalf of Wampole Laboratories, Stamford, Conn., who supplied the plastic device for administering an enema under the name of Rectalad Enema.

THE JOURNAL

OF THE AMERICAN MEDICAL ASSOCIATION



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Cable Address "Medic, Chicago"

THE ETIOLOGY OF OSTEOPOROSIS

GUEST EDITORIAL

Marshall R. Urist, M.D.

OSTEOPOROSIS, the most common disorder of the skeletal system, occurring chiefly in elderly persons, means literally an increased porosity of bone. This is to say that it refers to a decrease in the hard portions of bone substance in favor of a relative increase in the soft portions. It is commonly recognized as the end-result of loss in mass of the bones, ordinarily without any change in their volume or external configuration until pressures from without bring about collapse of the structures weakened from within.

The diagnosis of osteoporosis is usually based on radiographic evidence of collapsed vertebrae, expanded intervertebral disks, and thinning of the cortex of the bones. Attention is frequently called to the condition by the pain and deformity incident to collapse of the vertebral bodies, or to pathological fractures in the spine; routine laboratory procedures give little information.

The pathogenesis of this disorder is a subject of intensive investigation. It has been attributed to mineral, vitamin, and endocrine deficiencies, or to a combination of these. Because few, if any, patients have been cured by attempts to correct any such deficiencies, there is now a tendency to regard the majority of cases, rather than the exceptional ones, as idiopathic. Patients with this condition are most commonly found on orthopedic wards. About 76% of our series of patients with fracture of the hip had

collapsed vertebrae and osteoporosis. Loss of height, backache, and deformity are generally regarded by these patients as natural infirmities of old age. It is now clear that these symptoms are due specifically to osteoporosis and not aging per se.

At a symposium¹ in Philadelphia (Lankenau Hospital Conference), Oct. 30-31, 1958, on Bone as a Tissue, investigators from the United States and abroad discussed recent advances and the future course for research on osteoporosis. Nordin of Scotland suggested that osteoporosis must result from negative calcium balance and that calcium deficiency, either low intake or malabsorption or hypercalciuria, was the chief cause. Whedon of Bethesda, Md., observed that osteoporosis of disuse in paraplegics may involve neuroendocrine factors of unknown nature. I have reported that patients with severe senile osteoporosis and those of comparable age without osteoporosis have the same endocrine disorders, the same levels of production of protein, 17-ketosteroids, 11-oxy-17-hydroxycorticosteroids, and alkaline phosphatase, and the same urinary excretion patterns of the adrenal or gonadal hormones. There is also approximately the same dietary intake of calcium, vitamins, and protein in the two groups. Smith of Detroit discussed data to corroborate my findings but also, at the same time, data to support Nordin's thesis in that he finds that the persons with osteoporosis had a lower average calcium intake than persons without osteoporosis. Reifstein of New York suggested that, while the low-gonadal-normal-corticoid hormone imbalance of old age occurs in persons with osteoporosis and those without osteoporosis, it is one factor, though not the only one, that is generally found in the background of this disorder.

The nutrition of calcium appears to be a secondary factor insofar as low calcium intake or malabsorption may accentuate the disorder in persons who are susceptible to osteoporosis. Normally, the body has the capacity to adapt to low calcium intake in two to eight months, and some persons are able to make up previous losses of calcium even while they are still on a low calcium diet. Intakes as low as 100 to 200 mg. per day are adequate for equilibrium in some instances.² However, such low levels of calcium intake have been found in many persons with senile osteoporosis. When the level of calcium in the diet is increased to 900 mg. per day, the patients can retain calcium, but evidence of restoration of bone density from such treatment is lacking.³ Lifetime experiments with rats on adequate and high calcium diets show that negative calcium balance in old age merely indicates lower consumption of calcium than that to which the individual was previously accustomed. It has not been established that lifelong high calcium diet is any insurance against osteoporosis; it is possible that it may be detrimental in later life.

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More information is needed about the normal progress of aging of the skeleton of persons who do not have collapsed vertebrae or other evidence of osteoporosis. The data that are available include, of necessity, at least 18% men and 26% women who have osteoporosis. Ingalls' ⁴ collection of 6,000 human skeletons probably includes both persons with osteoporosis and those without osteoporosis, but it seems to indicate that the human does lose bone weight with aging. The loss of bone mass in normal aging is obviously much slower than in osteoporosis. Whether there is a qualitative as well as quantitative difference in the structure of the bone matrix can be determined by measurements of the hexosamine and collagen of the decalcified bone tissue.

X-ray is the only available method of diagnosis of loss of bone mass or osteoporosis. Unfortunately, it is not sufficiently sensitive to detect osteoporosis before one-third of the total volume of the skeleton is lost. It is also disappointing that radioisotope techniques have not made it possible to measure bone volume and detect osteoporosis at an early stage. Radioisotopes label new deposits of bone mineral and reveal the rate of bone formation rather than the amount of bone in the body. MacDonald ⁵ observed that the rate of uptake of radioactive strontium (Sr^{85}) was lower in the first half-hour after intravenous infusions in persons with osteoporosis as compared with persons without osteoporosis. Nordin ⁶ administered radioactive calcium (Ca^{47}) and observed that the uptake of the isotope over a period of several days was normal. Bauer, ⁷ using both Sr^{85} and Ca^{47} , found that accretion (uptake) was either low, normal, or high in persons with osteoporosis. While isotopes are as yet not helpful in the diagnosis of osteoporosis, they can be useful for excluding other conditions.

The literature on osteoporosis includes a great many review articles. The majority of writers favor one or another of the endocrine theories rather than the theory of malconsumption of calcium. The endocrine theories are based chiefly on metabolic balance studies on patients by Albright ⁸ and his associates, or pupils, notably Reifstein, ⁹ Henne-
man, ¹⁰ and Bartter, ¹¹ who up to this time have presented some of the best quantitative data in the literature. The evidence advanced in favor of the hormonal theory is that (1) nearly all of the causes of osteoporosis are endocrine disorders; (2) prolonged administration of cortisone and related adrenal cortical steroids produces osteoporosis resembling that seen in adrenal cortical hyperfunction (Cushing's syndrome) in man; (3) administration of sex hormones to patients with postmenopausal, senile, or hypercorticotoid osteoporosis produces calcium and nitrogen retention and relieves the patient of further fractures; and (4) administration of sex hor-

mones produces positive calcium and nitrogen balance in male subjects with osteoporosis but not in males of comparable age without osteoporosis. The hormonal metabolite, present or absent, responsible for osteoporosis is not yet known and need not necessarily be revealed by measuring hormones—free, bound, or conjugated—in the plasma and urine; in chronic disorders the active form of most steroid hormones is in a steady state, and blood levels do not disclose the level of production, or utilization. The literature following the works of Albright and his associates lists 18 causes of osteoporosis; I ¹² have suggested that there could be one mechanism common to all causes, and this was the bone resorbing action of normal levels of production of 11-oxy-17-hydroxycorticosteroids. Hypertrophy of the adrenal cortex occurs in birds on calcium-deficient diets. Protein-deficient diets and starvation also produce similar adrenal cortical overactivity. Thus, the effects of a dietary deficiency would not necessarily be separable from the effects of hormonal, especially adrenal, regulation of calcium and bone metabolism.

The evidence advanced against the endocrine theory is that (1) the majority of patients who have various endocrine disorders, such as ovarian insufficiency, castration, or senility, do not develop osteoporosis; (2) adrenal steroids cause fractures mainly in persons who already have osteoporosis, are of an advanced age, or have a disease that predisposes them to osteoporosis; (3) sex hormone treatment of patients with osteoporosis appears to be nonspecific, without effect on the cause of the condition, and does not restore the density of the bones; (4) severe osteoporosis has been observed in some patients living on a low calcium intake diet, possibly with negative calcium balances, for many years; and (5) osteoporotic patients found in calcium equilibrium on a low calcium intake have exhibited positive calcium balance when the intake of calcium was increased in the diet.

A first glance at the present knowledge of osteoporosis would lead to the conclusion that it results from a combination of circumstances: a nutritional (mineral, protein, or vitamin) deficiency, an endocrine disorder, aging, and a sedentary existence or disuse. The solution to the problem, however, is probably not as hopeless as would be implied by this conclusion. The majority of patients with osteoporosis have none of these known conditions except aging, and, furthermore, the disturbance occurs frequently enough in young persons to suspect that chronological aging is not the critical etiological factor. For a working hypothesis and to plan new experiments, I have suggested an "antiosteoporosis" factor, postulated to be present in patients who do not have osteoporosis and deficient or absent in

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patients who do have osteoporosis. The concept of an antiosteoporosis factor seems attractive because this disorder occurs at the normal level of intake and metabolism of those nutritional and endocrine factors that have been measured in the diet, blood, and excreta.¹³ An antiosteoporosis factor seems to be absent in patients who show negative calcium balance, osteoporosis, and pathological fractures when receiving certain doses of cortisones but seems to be present in persons who do not show negative calcium balance and osteoporosis when receiving the same dose of this adrenal steroid. Because I have found generalized body atrophy and small rather than large adrenal glands in patients with severe osteoporosis, it is postulated that an antiosteoporosis factor may be lacking in the adrenal cortex or muscle, or bone itself. It is not unlikely that this factor may be related to the capacity of the person to adapt to low calcium diets.

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(Continued from February 7, 1959 issue, page 607)

Supplementary Reports of Council on Medical Service.—Supplementary reports (A-G) were presented by the Chairman, Dr. Joseph D. McCarthy and referred to the Reference Committee on Insurance and Medical Service.

A. Insurance and Prepayment Plans.—The Council has reorganized its committee structure; the activities of the Committee on Prepayment Medical and Hospital Service and the Committee on Relations with Lay Sponsored Voluntary Health Plans have been combined (Handbook, page 234; THE JOURNAL, Oct. 25, page 1100), and a new committee formed entitled the Committee on Insurance and Prepayment Plans under the chairmanship of Dr. Carlton E. Wertz, New York. The committee plans to study insurance problems in the following fields: Blue Shield, private carrier health insurance, life insurance, disability insurance, professional liability insurance, Blue Cross, and consumer sponsored plans; consultants have been selected in each of these fields. Pamphlets will be sent to physicians from time to time to supply information in the aforementioned and other fields involved in the practice of medicine. "Buyer's Guides" to inform the public in analyzing the merits of available health insurance programs will be sent to physicians for their patients. Other activities under way are the improvement of liaison with all recognized representatives in the field of insurance, and a study of excessive utilization of hospital facilities. A basic statement entitled, "Let's Use, Not Abuse," was agreed upon by the Council and its Committee and was published in the A. M. A. News.

The Council through its former Committee on Prepayment Medical and Hospital Service had submitted to the House for its consideration at the 1958 Annual Meeting, a set of "Suggested Guides for Medical Society Sponsored Voluntary Prepayment Medical Benefit Plans." The guides were returned to the Council for further study and report at the 1958 Minneapolis Meeting; the Council after further consideration resubmitted the suggested guides in the same form as originally proposed in June, and recommended that they be approved by the House.

The Reference Committee was particularly impressed with the high caliber of the membership of the new Committee on Insurance and Prepayment Plans, seemingly a wise move to assure broad representation on this new committee. With respect to the projected study of excessive utilization of hospital facilities, the committee stated that much criticism is being leveled against physicians, patients and other parties on this score.

With reference to the "Suggested Guides for Medical Society Sponsored Voluntary Prepayment Medical Benefit Plans," the Reference Committee pointed out that the welfare of the patient is paramount in the physician-patient relationship and is best enhanced by sponsorship of a voluntary prepayment medical benefit plan by a county or state medical association. The Reference Committee reviewed the ten suggested guides and recommended their adoption.

B. Activities in Reference to Aging and the Aged.—The report covered the AMA Planning Conference for Medical Society Action in the Field of Aging which was held in Chicago on Sept. 13-14, 1958. Agreement was reached on three important concepts: (1) Medicine has a major respon-

sibility to provide effective leadership in meeting the special needs of the aged; (2) a coordinated approach to be used, utilizing state and county groups interested in this problem; and (3) any effort to break up the family into groups should be resisted; the aged should not be isolated.

In June, 1958, the House of Delegates adopted a resolution (No. 7, Ohio Delegation) which called for immediate steps to confer with voluntary health insuring agencies and organizations on the feasibility of offering a contract which will provide (1) medical and hospital coverage for those beyond the age of 65, and (2) a method whereby the insured may secure paid-up coverage for life through the payment of necessary premiums prior to attaining the age of 65 years. The resolution was referred to the Board of Trustees for proper implementation; the Board subsequently referred it to the Council on Medical Service.

The Council pointed out that this is not a new problem. It has continued to follow efforts and encourage experimentation in the development of programs designed to assist retired persons in financing their health care; it has conferred with representatives of Blue Shield, Blue Cross and private insurance carriers. In addition to the special efforts of insuring organizations, employers, Foundations, etc., there are also the activities of other groups that increase the availability of health insurance for those who are retired as well as for those who are age 65 and over.

The Council stated that it will continue to keep informed on all developments, will seek to encourage them, and will report to the House of Delegates, the profession and the public through the A. M. A. Communications Division.

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Constituent associations have evinced varying reactions since the curtailment of the program. In general, the associations have agreed to give the restricted program a fair trial. Aware that this program is of concern to practicing physicians, the Committee on Federal Medical Services sponsored a one day conference in Minneapolis on Dec. 1, 1958, to which representatives of all constituent associations were invited; a substantial portion of the program was devoted to Medicare.

(2) *Free Choice of Physicians by Federal Employees:* The House of Delegates at its June, 1957 meeting adopted a resolution (No. 4) on "Free Choice of Physicians by Federal Employees" calling specifically for changes in the Federal Employees' Compensation Act. The resolution was referred to the Council on Medical Service for whatever action it deemed necessary.

After thorough discussion of the factors involved by the Committee on Federal Medical Services, the Council voted to refer the resolution to the newly established Committee on Workmen's Compensation of the Council on Industrial Health as the most appropriate group to implement its recommendations. The Council suggested to that Committee that it give serious consideration to recommending to the Board of Trustees that it work through the Committee on Legislation to introduce and actively support amendments to the three federally administered workmen's compensation laws to carry out the mandates of the House.

(3) *Veterans' Medical Care:* The House of Delegates at the June, 1958 meeting adopted a resolution (No. 30) which urged congressional action to restrict hospitalization of veterans at VA hospitals to those with service-connected disabilities and recommended suggesting to the Dean's committees that they restrict their activities to Veterans Administration hospitals admitting only patients with service-connected disabilities. The Council stated that this does not change the A. M. A. policy on veterans' care, but does suggest a further implementation of that policy through the suggestion to the Dean's committees. The Dean's committee residency and internship programs were inaugurated over a decade ago with the cooperation of the medical profession, the objective at that time being to raise the standards of medical care for a large number of injured veterans returning from World War II. This objective has been achieved and now the VA teaching program is in competition with non-federal medical facilities. The full potential of this trend needs to be explored to determine what its effect is and will be on residency programs in non-federal hospitals.

As one step in exploring means of implementing this resolution, the Committee on Federal Medical Services also devoted a portion of its Dec. 1 conference to a discussion of the question, "Are Education and Research Essential to Veterans' Medical Care?" A report on this meeting will be published in the near future.

The Council believed that this is the appropriate time to implement the public education campaign regarding the AMA policy on veterans' medical care; three leaflets have been published to date with the assistance of the AMA Communications Division.

The Reference Committee studied thoroughly the reasons given for the recent curtailment of the Medicare program. (1). The committee took due notice of these changes, and regretted the substitution of federal facilities for private care in the areas mentioned. The committee urged that the Association encourage the re-establishment of services under the free choice principle to accomplish the original intent of the act.

The Reference Committee was in agreement with the referral of the resolution (2) to the Committee on Workmen's Compensation of the Council on Industrial Health for implementation.

The Reference Committee agreed that hospitalization in VA hospitals (3) should be restricted to those with service-connected disabilities. It drew particular attention to the statement "now the VA teaching program is in competition with non-federal facilities. The full potential of this trend needs to be explored to determine what its effect is and will

be on residency programs in non-federal hospitals." The Reference Committee believed that this problem deserves further study by the Council on Medical Education and Hospitals and the Council on Medical Service.

The Reference Committee heartily endorsed the public education campaign recently instituted by the Council on Medical Service in regard to the AMA policy on veterans' medical care.

D. Medical and Related Facilities.—In accordance with the instructions of the Council on Medical Service regarding an action (resolution no. 55) at the June, 1958, Meeting of the House of Delegates, the Committee on Medical and Related Facilities approved an amendment to Part I of the policy publication entitled, "Relation of Physicians and Hospitals" which reads as follows:

"Neither the medical staff nor hospital management has the privilege or the right to make compulsory assessments of members of the medical staff for building funds or to demand an audit of staff members' personal financial records as a requisite for staff appointment."

The Council submitted a progress report on the Study of the Organizational and Professional Relationships Between Physicians in Private Practice and those not in Private Practice. The three physician groups to be included in the study are: (1) physicians employed full-time by official health agencies and other government services; (2) physicians employed full-time by insurance companies, industries, pharmaceutical houses, voluntary health agencies, and research foundations, and (3) physicians employed full-time in medical schools, hospitals and other educational institutions.

A report on the nursing home survey was made by the Council; staff members are visiting skilled nursing homes in various parts of the country to obtain information to aid in developing guides and standards for medical care in nursing homes and related facilities.

Subsequent to an action of the House of Delegates at its June 1958 Meeting (resolution no. 32) the Council instructed its Committee on Medical and Related Facilities to proceed with a study to determine whether or not the growing practice by hospitals of encouraging staff members to conduct their private office practice within or adjacent to the hospital is a major move toward the practice of medicine by hospitals. Available information has been compiled.

The Reference Committee endorsed the action of the Council and its Committee on Medical and Related Facilities regarding the adoption of a 1958 amendment to the 1951 statement of policy on "Relation of Physicians and Hospitals."

The Reference Committee commended the Council for the study it has instituted dealing with the "Organization and Professional Relationships Between Physicians in Private Practice and Those Not in Private Practice," and also for its nursing home survey. The Reference Committee urged the continuation of these studies as well as the continued investigation of the apparent present trend to develop private office practice within or adjacent to hospitals.

E. Third Party Conferences.—At the December, 1957, Meeting of the House of Delegates an action was taken (resolution no. 24) asking that the "appropriate committee or council to engage in conferences with third parties develop general principles and policies which may be applied in the relationship between third parties and the medical profession." A report was made to the Board of Trustees by the Council on Medical Service on May 18, 1958. On October 17, 1958, the Council held the first of a series of meetings with "third party" representatives, which met in a mutual effort to seek a foundation for better understanding and cooperation between these "third party" mechanisms and the physicians serving them, and also in their relationships to other members of the medical profession. The Council believes that the attainment of the objectives of resolution no. 24 calls for a reassessment of some of the medical profession's previous policy statements and attitudes toward these plans, and for the recognition of those responsibilities which it must more actively assume in the immediate future.

The Council concluded as a result of this meeting that the bases for the observations and recommendations it made to the Board of Trustees prior to the 1958 Annual Session were well-founded and that a more realistic and positive program of physician information, cooperation with these third parties, plus self-discipline by the medical profession must be embarked upon by constituent and component societies of the Association if the objectives of resolution no. 24 are to be achieved.

The Council is of the opinion that whatever progress is to be achieved in the future cannot be made by unilateral action—whether by the medical profession or “third parties”—in matters which intimately concern both groups. Problems and issues which have disturbed relationships in the past must be resolved on the basis of a mutual acceptance of responsibility, an understanding of the professional relationships and patient care involved, and other social and economic factors. The Council believes that the profession itself must more rigorously exercise those controls and safeguards which will assure the provision of good medical care at a cost which the public can afford.

The Reference Committee called attention to the Council's emphasis on two factors: (1) The necessity for a reassessment of some of the medical profession's previous policy statements and attitudes toward these plans, and (2) the exercise of more rigorous controls and safeguards which will assure the provision of good medical care at a cost which the public can afford.

The committee was in complete agreement with this report and recommended that the conference method of attempting to achieve a better understanding between the profession and third parties be continued.

F. Indigent Medical Care.—The Council reported that the Social Security Amendments of 1958 now in effect are in accord with the June 1958 policy reaffirmation by the House. It is now the prerogative of the states to determine what proportion of their public assistance funds shall be expended in money payments (paid to recipient) and what portion in vendor payments (paid directly to physician), with no financial advantage of increased federal aid attached to any particular ratio.

Resolution No. 4 (June 1958), calling attention to “confusion, waste and duplication” resulting from a multiplicity of programs for medical care of the indigent under the Social Security Law, was considered by the Council. The resolution recommended that this program be completely revised by Congress and that any public assistance funds for medical care of the indigent be “administered by a voluntary agency such as Blue Shield on a cost plus basis or by a specific agency established by the medical society of the state in which indigent care is rendered.”

The Council, although in agreement with the statement on the confusion, waste and duplication inherent in the present multiplicity of programs, did not believe that this confusion can be eliminated by naming a single administering agency. It felt that the first step should be basic revision in federal law so that appropriations for medical care for Public Assistance recipients may be used by the states to best meet their needs. Recommendations of the Council were: (1) That the Social Security Act be amended by Congress to permit states to combine the present four Public Assistance medical programs into a single medical program, administered by a single agency and making available uniformity of services to all eligible Public Assistance recipients in the state, and (2) that each state medical association give serious consideration to the use of a “voluntary agency such as Blue Shield” or of a “specific agency established by the Medical Society” for the administration of “any funds provided under the Public Assistance provisions of the Social Security Act for medical care of the indigent.”

Resolution No. 47 (June 1958) criticized the current indigent care legislation and the provision of these services to “non-indigent and non-deserving persons” and called these acts “a relative failure of our public relations and legislative programs with Congress and the people at large.” It requested the appointment of a special committee to “study,

anticipate, educate, and in the best interests of the people prepare for future legislation on this subject.” The resolution was approved in principle and referred to the Board of Trustees for study; the Board subsequently referred it to the Council on Medical Service for study and report to the House.

The Council on Medical Service believes that the suggested aims of the resolution are already adequately served by existing divisions, councils, and departments of the Association. It was repeated that public assistance is primarily a state program, with federal financial participation. The authority to determine methods and amounts of payment for indigent medical care services has been fully returned to the states. The Council, therefore, feels that, aside from its recommendation that the medical aspects of the four categorical assistance programs be combined, the primary activity in this field is at the state and local level. The Council reiterated its recommendation to the House in December, 1957, (1) that state and county societies take an active and organized interest in this problem which has traditionally been considered a responsibility of the medical profession; (2) that, even in those areas where the physicians prefer providing care through their own charity to being paid from the welfare funds, there should be a definite program to assure that every needy person shall have the necessary physician's services to the extent available in the community; (3) that constituent and component medical societies establish formal liaison with governmental agencies concerned in the provision of health services to the indigent in their areas, and through such liaison they can act in an advisory capacity to assure the adequacy of the health care of those who cannot meet the cost of such care through their own resources, and (4) that constituent and component indigent care committees inform themselves regarding laws and regulations governing determination of eligibility and examine both the validity of these standards and their application.

The Reference Committee concurred in the recommendations of the Council on Medical Service; and recommended that the Board of Trustees send a letter, with suitable explanation of the urgency of the problem, to each state medical association.

G. Guide for Study of Perinatal Mortality and Morbidity.—The Committee on Maternal and Child Care submitted a guide as a complement to its 1957 publication entitled, “A Guide for Maternal Death Studies.” The guide is intended as a flexible basic program for hospitals, and state and county medical societies in cooperation with state and local health departments, in their combined efforts to reduce deaths and morbidity in the perinatal period.

The Reference Committee found the report generally complete and well conceived. It believed, however, that minor changes should be made in the organization of the text; the changes were discussed and agreed upon with the chairman of the Committee on Maternal and Child Care. Anticipating that the changes can be made simply and without alteration of purpose and meaning, the Reference Committee recommended adoption of the report.

H. Voluntary Health Coverage for the Aged.—The Council submitted a statement relative to voluntary health insurance or prepayment coverage for the aged.

The statement as approved by the Reference Committee is as follows:

“For persons over 65 years of age with reduced incomes and very modest resources, it is necessary immediately to develop further the voluntary health insurance or prepayment plans in a way that would be acceptable both to the recipients and the medical profession. The medical profession must continue to assert its leadership and responsibility for assuring adequate medical care for this group of our citizens.

“Therefore, the Council on Medical Service recommends to the House of Delegates the adoption of the following proposal: That the American Medical Association, the constituent and component medical societies, as well as physicians everywhere, expedite the development of an effective

voluntary health insurance or prepayment program for the group over 65 with modest resources or low family income; that physicians agree to accept a level of compensation for medical services rendered to this group, which will permit the development of such insurance and prepayment plans at a reduced premium rate.

"This recommendation has been studied and restudied by the Board of Trustees and has received its wholehearted endorsement."

The Reference Committee recommended that in order to effect the immediate implementation of such a program copies of this report be distributed to medical society approved plans, including Blue Shield and private insurance programs, requesting their cooperation.

Committee to Study A. M. A. Objectives and Basic Programs.—The Chairman of the Committee to Study A. M. A. Objectives and Basic Programs which was appointed by the Speaker pursuant to an action taken at the meeting of the House of Delegates in Philadelphia in December, 1957, submitted its report together with two appendices. The Committee was requested to study four subjects: (a) redefinition of the central concept of A. M. A. objectives and basic programs; (b) placing more emphasis on scientific activities; (c) taking the lead in creating more cohesion among national medical societies; and (d) studying socioeconomic problems.

Recommendations made by the Committee are as follows: (1) That the House of Delegates consider the advisability of amending Article II of the Constitution by this substitution: "The objectives of the Association are to promote the science and art of medicine and the betterment of public health, and an understanding of the socioeconomic and political conditions which will facilitate the attainment of these objectives"; (2) That the Board of Trustees give serious consideration to the establishment of some more effective mechanism to insure continued study of the scientific activities of the Association with the ultimate intent and purpose of revamping and otherwise changing them as deemed necessary; (3) That the Board of Trustees in establishing a mechanism for the continued study of the scientific activities of the A. M. A. insure that the mechanism will assume the responsibility for establishing active liaison with each national medical society; (4) The establishment for a period of three years of a Council or Committee on Socioeconomics to investigate socioeconomic and related problems with which the Association is likely to be confronted in future years; (5) That the Board of Trustees give serious consideration to opening the publications of the Association to a free and open discussion of socioeconomic problems applicable to medicine; and (6) That the Committee should be discharged.

The Reference Committee on Miscellaneous Business indicated that it spent an unusual amount of time in studying this report and in listening to the free discussion in open session; that the tremendous interest manifested by the respondents to the questionnaires, by oral discussions in small groups, and by the spirited review before the reference committee was truly heartening, and that this report may be a most significant milepost in the history of the American Medical Association.

With the far-reaching changes that have evolved in the socioeconomic and political areas of this country, the Reference Committee stated that it was logical that an organization such as the A. M. A. can profitably take stock of its expressed objectives or purposes, and its basic programs of service and activity. The work of this Committee has proved that American physicians can evaluate themselves professionally, and as citizens, can recognize areas of needed improvement; can outline practical ways of maintaining the highest standards of health in this country, within the framework of private enterprise, the truly American way of life.

In a sincere desire to stimulate progress in medicine in every specialty and area, the A. M. A. has encouraged specialty societies, and it is only natural that in the multiplicity of medical groups the stature and prestige of the parent organization may not be so apparent. But it is easily

possible for the A. M. A. to continue as the "fountain-head" of virile, worthwhile scientific groups, and yet sponsor such a bold, vigorous, constructive, logical program that its leadership will be recognized and respected more than ever before.

Clearly the members of the A. M. A. are convinced that sociological and economic trends and conditions of today constitute an important aspect in the medical care of the patient and of the practice of medicine.

The Reference Committee recommended that the first recommendation of this special committee (that the House of Delegates consider amendment of Article II of the Constitution) be referred to the Council on Constitution and Bylaws.

The Reference Committee recommended that the Board of Trustees establish a mechanism which will assume the responsibility for promoting active liaison with each national medical society. The intent of this liaison should be to explore all fields of interrelationship between the A. M. A. and the national medical societies. There should be an attempt to define the area of activity of each organization. In the scientific fields the role of the A. M. A. should be primarily that of leadership, but every endeavor should be made to bring about coordination of the special fields of scientific interest of the other national medical organizations.

Since the Board of Trustees in Supplementary Report L announced a very comprehensive plan to establish and develop a Division of Socio-Economic Activities, the Reference Committee felt that there is no necessity for the creation of a new council or committee on socio-economics. The House of Delegates will be informed periodically on the progress of this new Division of Socio-Economic Activities through the medium of semi-annual reports to the House and the regular media of publications.

The Reference Committee approved the recommendation that the Board of Trustees give serious consideration to opening the publications of the Association to a free and open discussion of socio-economic problems applicable to medicine. Members and officers of the Association should be encouraged to contribute items to this section of the publication or publications.

The Reference Committee stated that the Committee to Study A. M. A. Objectives and Basic Programs has served faithfully and correctly pointed out that the assignment given to it by the House last December was so comprehensive that no one group could be expected to cover the responsibilities completely, particularly in the space of a few months' time.

It was apparent to the Reference Committee that the work of analysis and improvement of basic programs of the A. M. A. will continue through the mechanisms mentioned in this report. The Reference Committee recommended that this special committee should be relieved of further responsibility, with the additional recommendation of an expression by the House of Delegates of deep appreciation and thanks for a task well done.

Commission on Medical Care Plans.—The Chairman of the Commission on Medical Care Plans, appointed by the Board of Trustees on Nov. 29, 1954, submitted Part I of its report on "Findings, Conclusions, and Recommendations." The Commission was appointed to determine whether current medical care plans are effectively promoting (1) the highest quality of health services; (2) the welfare of the public and the medical profession, and (3) the ethical standards of the medical profession. Part I of the report was published as a supplement to the Jan. 17, 1959, issue of *THE JOURNAL*. A limited supply of copies of Part II of the report on "Statistical Appendices and Background Materials" is available for distribution to physicians requesting single copies.

The Reference Committee on Insurance and Medical Service which considered this report indicated that the weight of testimony in the hearings indicated that many members had not had an opportunity to study the report and, therefore, were unable to render an opinion. Consequently, the Reference Committee recommended that the report be received without discussion and that further action be deferred

until the June, 1959, Meeting of the House of Delegates.

The Reference Committee stated that it had studied the Commission's report prior to the Minneapolis Meeting; it respectfully suggested to the constituent associations reviewing the report prior to the June, 1959, meeting that their attitude regarding the report will be clarified if they arrive at some decision in regard to the following basic points:

1. Free Choice of Physician

Acknowledging the importance of free choice of physician, is this concept to be considered a fundamental principle, incontrovertible, unalterable, and essential to good medical care without qualification?

2. Closed Panel Systems

What is or will be your attitude regarding physician participation in those systems of medical care which restrict free choice of physician?

These suggestions acknowledge that the policy of the American Medical Association to encourage and support the highest quality of medical care for all patients remains unchanged. They question, however, whether attitudes toward the free choice of physician and the closed panel system may be undergoing evolutionary change.

The Reference Committee suggested that the answers and other pertinent statements would be most welcome to the Board of Trustees and to the House of Delegates. The committee, therefore, recommended that the Board of Trustees issue an invitation to the constituent associations to forward their replies to these questions to Dr. F. J. L. Blasingame, Executive Vice President, 60 days in advance of the June, 1959, Annual Session.

Committee on Medical Practices.—The Chairman of the Committee on Medical Practices submitted a report on relative value studies pursuant to a directive of the House regarding the development of such a schedule for diagnostic, medical, and surgical services and a program of public education designed to bring about a better understanding of all fields of medical practice. Four approaches outlined in its 1957 report were: (1) an approach from the point of view that any change in the relationship between medical services and surgical services must originate within the profession itself; (2) an approach through public education; (3) an approach through a relative value schedule for the whole of the practice of medicine, and (4) an approach from the standpoint of costs or cost accounting.

The House of Delegates at the time it approved the Committee's 1957 report also approved the recommendation that the term "relative value study" be used in lieu of "relative value schedule."

The Committee indicated that in the past year it has dealt primarily with relative value studies of medical and surgical services. The report commented on (1) background; (2) lack of relationship between benefit payment and professional fees; (3) that relative value studies are not fee schedules; (4) need for relative value studies, and (5) alternative methods of the study or studies.

The Committee was of the opinion that the need for such a study or studies is apparent and demonstrable in the light of current developments. It was also of the opinion that unless a study or studies of this type are made in the very near future and adopted by the medical profession, medicine runs the risk of alienating public opinion and losing its bargaining position with other agencies, private and governmental, which are engaged in financing the cost of medical care to the American public. It stated that although the national and regional forms of the study possess the merit of achieving uniformity, the most practical and, ultimately, the most acceptable method of study might be that conducted in each state, with the sponsorship and leadership role of the state association spearheading the study. At the same time the Committee believes that the nomenclature, descriptions, and code numbers of the California Relative Value Study can well be accepted as a national format.

Additionally, the Committee believes the A. M. A. should assist state associations wishing to undertake such studies by preparing basic material such as questionnaires, sampling

methods, and lists of procedures and code numbers and making this material available to these associations. Technical assistance and guidance might also be made available through this Committee, its consultants, and staff.

The Committee recommended (1) that the House of Delegates approve in principle the conducting of relative value studies by each state medical association, rather than a nationwide study or a series of regional studies by this Association; (2) that the Committee be authorized to inform each state medical association, through regional or other meetings, of the purpose, scope, and objectives of such studies, the steps to be followed in conducting studies, the problems which may be encountered and the manner in which the results can be applied; and (3) that the Committee be authorized to assist those states desiring to undertake relative value studies.

The Reference Committee on Miscellaneous Business reviewed this report carefully and with much interest.

The Reference Committee was of the opinion that the need for a study or studies is apparent and demonstrable in the light of current developments, and that unless medicine undertakes this activity, it may be done by others who are less qualified.

The Reference Committee concurred in the report of the Committee on Medical Practices and its recommendations. With reference to the recommendation no. 2, the Reference Committee stated that proper utilization should be made of *THE JOURNAL*, the A. M. A. News and other suitable news media.

The Reference Committee also recommended that the nomenclature descriptions and code numbers of the California Relative Value Study (almost identical with those of Kansas and Iowa) be accepted as a national format.

It is to be clearly understood that this is to be used as a format to avoid confusion. No unit values and/or dollar values are to be used or suggested.

Woman's Auxiliary.—The Speaker referred the remarks of Mrs. E. Arthur Underwood, President, and the report of the Woman's Auxiliary as printed in the Handbook of the House of Delegates (see *THE JOURNAL*, Oct. 25, 1958, pages 287-291) to the Reference Committee on Miscellaneous Business.

The Reference Committee reviewed the report with sincere interest and deep appreciation. The Committee stated that the cooperation of the Woman's Auxiliary is tremendous and it is gratifying to see that in many areas of the Association participation by the members of the Auxiliary is invited and utilized; that the ladies have accomplished real success in promoting interest in the American Medical Education Foundation with very substantial money contributions, in promoting *Today's Health*, and in their legislative efforts; that sponsorship of a Woman's Auxiliary to the Student A. M. A. was significant and will bear fruit in years to come, and that the report indicated that "Auxiliaries in Action" will bring increasingly encouraging reports. The Reference Committee recommended approval of the report with heartfelt thanks.

Appointments.—The following appointments were made:

Trustee: W. Linwood Ball, Richmond, Va., to succeed Warren Furey until June, 1959.

Members, Committee on Medical Practice: James P. Hammond, Bennington, Vt., to succeed himself, and John S. DeTar, Milan, Mich., to serve in place of Andrew Bunten, resigned.

Civil Defense Operations. No. 1 and 4. Resolutions were introduced by Dr. W. C. Kenner and Dr. Joseph D. McCarthy (No. 1) for the Nebraska State Medical Association and Dr. W. C. Bornemeier (No. 4) for the Illinois State Medical Society requesting that the American Medical Association endorse in principle the training and employment of reserve Armed Forces medical units for the initial phases of civil defense operations.

The Reference Committee on Medical Military Affairs which considered the two resolutions together, appreciated the thinking brought out in the resolutions, but recommended the adoption of the following substitute resolution:

WHEREAS, It is imperative that the present civil defense organization be reinforced and strengthened to make it capable of meeting the demands for massive medical and health services resulting from an enemy attack or other large-scale national disaster; and

WHEREAS, The reserve units of the Armed Forces are organizations in being which are capable of giving the type of service that could reinforce and strengthen the present civil defense effort in its initial phases without dislocating the defensive capability of the armed forces; and

WHEREAS, Such units would not be called and deployed immediately after an enemy attack; and

WHEREAS, The care of noncasualties and the care of casualties will be of prime importance as a medical activity in the ability of the United States to mobilize after an enemy attack and to initiate and sustain a counter attack which will determine to a large extent our ability to survive as a nation; therefore be it

Resolved, That the American Medical Association take immediate steps to recommend that discussion with appropriate federal departments be started with a view to developing a plan whereby reserve units and individuals who are not immediately involved in military operations, should be used to supplement civil defense operations; and be it further

Resolved, That a plan be developed with appropriate federal departments whereby reserve units be given an interim mission of supplementing civil defense operations in these initial activities; and be it further

Resolved, That consideration be given to the formulation of an orderly plan for the rapid training of civilians who have no military obligation to fill the places of medical reservists; and be it further

Resolved, That a plan be explored for the recruitment, training and use of former medical personnel who have no further military obligation so that their services may be utilized for civil defense purposes.

Mastitis Tubes: No. 2.—Dr. Gilson Colby Engel, Pennsylvania, introduced a resolution requesting that the Association recommend to the federal government (1) that the dispensing of mastitis tubes be controlled by the same laws that govern the dispensing of antibiotics directly to human beings in order to minimize the sensitization of human beings to antibiotics in their milk supply, and (2) that antibiotics, especially those which are effective in combating certain antibiotic-resistant bacteria, viruses, and fungi, be restricted to use in human beings in order to prevent their sensitization to these new antibiotics through the consumption of dairy products.

The Reference Committee on Hygiene, Public Health, and Industrial Health stated that the resolution pointed up a potential danger rather than a currently serious one. After hearing testimony from a number of witnesses, it recommended that the resolution be referred to the Council on Drugs for its consideration.

Social Security Coverage for Physicians: No. 3.—Dr. George A. Woodhouse, Ohio, introduced an informational resolution on the results of a mail poll of the members of the Ohio State Medical Association on the question: "Should Physicians Be Included in the Federal Social Security Program?"

The Reference Committee on Legislation and Public Relations stated that no action was necessary as the resolution was submitted for informational purposes. The committee recommended that the results of the poll be transmitted to the Board of Trustees for its information and for the information of any of the Councils or Committees of the Association concerned with this matter.

Prepaid Health Insurance: No. 5.—Drs. E. G. Chuinard and Archie O. Pitman, Oregon, introduced a resolution which requested that a congress on prepaid health insurance be held, at which plans would be formulated for offering sound and constantly improving voluntary health insurance to the citizens of our Nation.

The Reference Committee on Insurance and Medical Service recommended the adoption of the resolution with an amended resolve which reads as follows:

Resolved, That the Council on Medical Service be authorized to sponsor at the earliest practicable date a Congress on Prepaid Health Insurance to which all prepaid medical and hospital care plans shall be invited to send representatives to collaborate in formulating plans for offering sound and constantly improving voluntary health insurance to the citizens of our Nation.

A. M. A. News: No. 6.—Dr. Eustace A. Allen, Georgia, introduced a resolution requesting that the A. M. A. House of Delegates at its 1958 Minneapolis Meeting, heartily approve and laud the purpose, content and format of the A. M. A. News and that the House strongly recommend the continuance of the publication under its present and established policies.

The Reference Committee on Reports of Board of Trustees considered this resolution together with Supplementary Report H of the Board of Trustees (see page 604, *THE JOURNAL*, Feb. 7). The committee concurred heartily with the views expressed in this resolution and recommended its adoption.

Voluntary Health Agencies: No. 7.—Dr. Wendell C. Stover, Indiana, introduced a resolution requesting that the Association approve of local option in fund raising, consistent with the best results for the comprehensive need.

The Reference Committee on Legislation and Public Relations indicated that it carefully reviewed the resolution and heard considerable discussion by both opponents and proponents. It felt that this problem is multi-faceted and complicated and requires further study. It therefore recommended the adoption of the following substitute resolution:

WHEREAS, The House of Delegates of the American Medical Association in June, 1958, adopted the following resolution:

"1. That the House of Delegates reiterate its commendation and approval of the principle of voluntary health agencies.

"2. That it is the firm belief of the American Medical Association that these agencies should be free to conduct their own programs of research, public and professional education, and fund raising in their particular spheres of interest.

"3. That the House of Delegates respectfully requests that the American Medical Research Foundation take no action which would endanger the constructive activities of the national voluntary health agencies.

"4. That the Board of Trustees continue actively in studies of these perplexing problems looking forward to their ultimate solution."; and

WHEREAS, There is nothing in this action that is critical of the United Fund, as the United Fund is not even mentioned; and

WHEREAS, This action has been interpreted by some as disapproving the inclusion of voluntary health agencies in the United Fund drives; therefore be it

Resolved, That the American Medical Association neither approves nor disapproves of the inclusion of voluntary health agencies in United Fund drives; and be it further

Resolved, That the Board of Trustees be requested to arrange a top-level conference with the voluntary health agencies, the United Funds, and other parties interested in the raising of funds for health causes, with the view of resolving these misinterpretations and other difficulties in this area.

Dr. Austin Smith: No. 8.—Dr. John Calbraith for the Medical Society of the State of New York introduced a resolution requesting (1) that the House of Delegates express to Dr. Smith, first, its sincere regret at his resignation; second, its gratitude and appreciation for his long years of devoted, loyal and efficient service, and third, its best wishes to him for long life, health and happiness, and (2) that this resolution be included in the minutes of the

House and published in THE JOURNAL and a copy sent to Dr. Smith.

The House of Delegates unanimously adopted without reference to committee.

Nomination and Election of Committee Members: No. 9.—Dr. Henry Gibbons III for the California Medical Association introduced a resolution requesting the Board of Trustees to make known its nominations to committees elected by the House at the first meeting of the House of Delegates so that the House may become familiar with the candidates for whom they vote.

The Reference Committee on Reports of Board of Trustees stated that it was informed that the Board could easily implement this resolution, and recommended therefore that it be adopted.

Osteopathy: No. 10.—Dr. Wendell C. Stover, Indiana, introduced a resolution which requested the House of Delegates of the American Medical Association to recognize that the constituent medical associations have the right to establish the relationship of the medical profession to the osteopathic profession within their respective states.

The Reference Committee on Medical Education and Hospitals discussed the resolution at great length; it noted with favor that the American Osteopathic Association has amended its objectives as stated in its Constitution by deleting reference to the cultism of Andrew J. Still. However, the committee did not believe the resolution offered the appropriate solution to this problem and therefore recommended that (1) the resolution not be approved, (2) that the Judicial Council be requested to review the past pronouncements of the House of Delegates with respect to osteopathy and the status of the laws of the various states in this regard, and (3) that the Judicial Council, if possible, present its report and recommendations at the next meeting of the House.

Resident and Interns: No. 11.—Dr. Donovan F. Ward for the Iowa State Medical Society introduced a resolution calling to the attention of all individuals and institutions responsible for intern and resident training that medical services provided to patients are the responsibility of duly licensed attending physician staff members who are bound by ethical principles which preclude them from permitting sale of their services to patients by or on behalf of third parties, private or public institutions, or corporations.

The Reference Committee on Medical Education and Hospitals after considerable discussion stated that (1) it believed that the resolution as presented could be interpreted to encompass many matters not intended by the Iowa delegation, and (2) it was apparent that many of the implications of the resolution are presently under study and consideration. Pending the results of the study, the committee submitted a revised resolution which it believed fulfilled the major intent of the original resolution:

WHEREAS, It is a function of interns and residents to aid and assist attending physicians while learning to assume increasing patient care responsibility; and

WHEREAS, It is the legal and moral obligation of each attending physician to be responsible to his patients for their care when this care is shared with or administered by interns or residents on his behalf; and

WHEREAS, It is a well established principle that charges to his patients for medical services must be billed and collected by the attending physician (or in his name by his agent); therefore be it

Resolved, That this House of Delegates call to the attention of all individuals or institutions responsible for intern and resident training that medical services provided to patients in hospitals are the responsibility of duly licensed physicians. They are bound by the ethical principles enunciated in the "Guides for Conduct for Physicians in Relationships with Institutions" adopted by the House of Delegates in December 1951, and restated and reaffirmed by the House of Delegates at the time of the adoption of the present Principles of Medical Ethics in June 1957.

Licensure of Paramedical Groups: No. 12.—Dr. Donovan F. Ward for the Iowa State Medical Society introduced a resolution requesting that the Association go on record opposing licensure or registration of all paramedical personnel.

The Reference Committee on Medical Education and Hospitals recommended the adoption of the following substitute resolution:

WHEREAS, Numerous paramedical groups now exist that assist physicians in diagnosing and treating patients; and

WHEREAS, There appears to be an ever increasing desire on the part of these paramedical groups to enhance their stature through various means; and

WHEREAS, Organized medicine at every level is taking added interest in the affairs of these paramedical groups, and is making a conscientious effort to bring prestige to these medical assistants as evidenced by the creation of a special committee of the American Medical Association to study relations with paramedical groups and the appointment of similar committees in many of the states; and

WHEREAS, All paramedical personnel should work under supervision of physicians, serving as the hands of physicians and not as independent agents; and

WHEREAS, It is well established that the stature of paramedical groups can be elevated on a voluntary basis through self-imposed educational standards, and through other measures as exemplified by the success of their own certifying boards; therefore be it

Resolved, That the House of Delegates of the American Medical Association go on record as encouraging the voluntary registration of the paramedical personnel who assist physicians, and be it further

Resolved, That the House of Delegates adopt a position of opposition to the extension of governmental licensure and governmental registration at this time. The Joint Committee to Study Paramedical Areas in Relation to Medicine, however, is requested to immediately expand its study to include this phase of the problem of the relationships of paramedical groups to the practice of medicine.

Council on Insurance and Pre-Payment Plans: No. 13.—Drs. Kenneth C. Sawyer and Edward E. H. Munro for the Colorado State Medical Society introduced a resolution requesting (1) that there be established a Standing Committee of the House of Delegates, to be known as the Council on Insurance and Pre-Payment Plans and to be composed of nine members; (2) that the duties and functions of the Committee on Insurance and Pre-Payment Plans, the Joint Committee on Medical Care for Industrial Workers, the Commission on Medical Care plans and all other matters of any kind related to insurance or pre-payment plans be transferred to this newly created Council, and (3) that the Council on Constitution and Bylaws be directed to implement this resolution.

The Reference Committee on Insurance and Medical Service indicated that it had carefully studied this resolution and fully realized the importance of the implications presented. However, it believed that the newly constituted Committee on Insurance and Prepayment Plans of the Council on Medical Service is adequate and satisfactory. The Reference Committee was informed (1) that this latter Committee has contacts with other committees of the Council on Medical Service which are involved to some extent in insurance problems; (2) that this Committee has been in existence only 6 months and is planning its program of activity; (3) a department of medical research activities is to be organized which will utilize consultants as an advisory committee to review problems submitted by various departments of the A. M. A.; (4) that it is planned to utilize services of research organizations throughout the country on specific problems and that this research arm will be available to various committees of the A. M. A., including the Committee on Insurance and Prepayment Plans. The Reference Committee stated that because of the facts submitted to the committee, it therefore recommended that this resolution be not adopted.

General Practitioner Award: No. 14.—Dr. L. R. Dame for the Massachusetts Medical Society introduced a resolution requesting the Association to bring to the attention of the Deans of Medical Schools and officers of medical societies the desirability of having certain General Practitioners of the Year as guests at meetings where students and younger physicians are present.

The Reference Committee on Medical Education and Hospitals recommended the adoption of this resolution.

Civil Defense and Disaster Information: No. 15.—Dr. Gilson C. Engel for the Medical Society of the State of Pennsylvania introduced a resolution urging the dedication of a portion of each edition of *THE JOURNAL* and of publications of state and county medical societies for dissemination of civil defense and/or disaster information.

The Reference Committee on Reports of Board of Trustees was in agreement with the intent of the resolution, but recommended the adoption of the following substitute "Resolve":

Resolve, That the House of Delegates of the American Medical Association urge strongly that pertinent information relating to civil defense and/or disaster planning be disseminated in *THE JOURNAL* of the American Medical Association and in the publications of state and county medical societies.

Cruelty in Maternity Wards: No. 16.—Dr. Stanley B. Weld, Connecticut, introduced a resolution calling attention to an article which appeared in the May and December, 1958, issues of *The Ladies Home Journal* on "Cruelty in Maternity Wards", and making several suggestions for the prevention of such articles in the future.

The Reference Committee on Legislation and Public Relations did not believe that the steps outlined in this resolution would serve to undo any harmful impact that these articles may have had. The committee stated that it was aware that the situations mentioned in these articles occur in a very small minority of cases, and that it did not believe that such articles are in the public interest. However, the committee believed that the Division of Communications of the Association should place even greater emphasis on its program of liaison with magazine editors and free lance writers. The committee recommended that this increased emphasis be inaugurated immediately so that such articles may be avoided in the future to the greatest extent possible.

Armed Forces Institute of Pathology: No. 17.—Dr. Lall G. Montgomery, Delegate, Section on Pathology and Physiology, introduced a resolution relative to a change of rank for the Director of the Armed Forces Institute of Pathology.

The Reference Committee on Medical Military Affairs stated that the objective to be accomplished by this resolution received the complete support of the military medical representatives and the civilian medical leaders who attended the hearings of the committee. The committee was of the opinion that the objectives of the resolution could be met by petitioning the Secretary of Defense, and recommended the adoption of the following substitute resolution:

WHEREAS, By virtue of the importance of the Armed Forces Institute of Pathology to both military and civilian medicine and more especially to Pathology in the world today, and in order to provide an adequate recognition of the responsibilities placed upon the Director of the Armed Forces Institute of Pathology; therefore be it

Resolved, That the American Medical Association petition the Secretary of Defense to provide for General or Flag rank for the Director of the Armed Forces Institute of Pathology during his tenure of office.

Memorial Stamp: No. 18.—Drs. W. Vinson Pierce and Robert Long, Kentucky, introduced a resolution requesting that the House of Delegates go on record as approving a memorial stamp commemorating the 150th anniversary of the first successful oophorectomy, and that it request the Post Office Department to issue an Ephraim McDowell-Jane Todd Crawford Memorial Stamp Commemorating that anniversary.

The House of Delegates unanimously adopted this resolution.

"MD INTERNATIONAL"

One of television's most acclaimed documentaries—"MD International," the inspiring story of the work of American physicians who serve in the far corners of the world—will be rebroadcasted in color from 5 to 6 p. m. (EST) Sunday, Feb. 22, on the full NBC network. This film received unprecedented praise from television critics, the viewing public, and members of the medical profession when it was originally presented by the American Medical Association and Smith Kline & French Laboratories in January, 1958. It sought to present two aspects of the work of U. S. physicians overseas—their accomplishments as men of medicine, and their service as unofficial ambassadors of good will. To find these dedicated men and women, a special seven-man March of Medicine film crew traveled 34,000 miles in 81 days, using every means of transportation from turbojets to Tibetan ponies.

At the end of the odyssey, the crew brought back unforgettable scenes from (1) Korea, where a small band of American-born-and-trained women physicians and nurses—members of the Maryknoll Sisters—care for 1,000 patients a day in what "Stars and Stripes" called the world's longest charity line; (2) Hong Kong, where a Chicago pathologist single-handedly battled native fear and superstition to establish a refuge for lepers; (3) Borneo, where for days at a time Dr. Harold Brewster, a New Yorker, lives with and treats the Ibans, a fierce tribe which once practiced head-hunting; (4) Nepal, the exotic little mountain kingdom between India and Tibet, where two American physicians practice Western medicine at its finest; (5) Ethiopia, where a U. S. Point Four mission has earned praise directly from Emperor Haile Selassie; and (6) India, where March of Medicine visited Vellore's famed Christian Medical College. Here, Dr. Victor Rambo travels from village to village performing cataract operations, and Dr. Reeve H. Betts, a Boston surgeon, performs the Blalock-Taussig operation for the tetralogy of Fallot. March of Medicine was the first series to receive the Albert Lasker award for medical journalism. "MD International" was chosen by the U. S. State Department to be shown at the Brussels World Fair.

DIGEST OF ACTIONS OF HOUSE OF DELEGATES

Because of the long felt need for a digest of the official actions of the A. M. A. House of Delegates a volume has just been compiled and is now ready for publication. Members of the House of Delegates, all agencies who have any dealings with the A. M. A., especially officers of state and local medical societies, surely will need and want this book. To profit by the prepublication price of only \$5 per copy orders should be placed at once with the Circulation and Records Department of the A. M. A. Further details are given in an editorial in the Feb. 7 issue of *THE JOURNAL* and in the advertising pages of this issue.

MEDICAL NEWS

FLORIDA

Dr. White to Give Annual Lecture.—The third annual Leonard G. Rowntree lecture will be given by Dr. Paul Dudley White Feb. 23, 8 p. m., in the Miami Women's Club Auditorium, Miami. The lecture is sponsored by the Phi Beta Pi fraternity, University of Miami School of Medicine chapter. Dr. White's subject will be "Sudden Death in Rome in the Winter of 1705-06: The Life and Times of a Great Physician."

MISSOURI

Physicians Meeting in Kansas City.—The fifth annual Missouri regional meeting of the American College of Physicians will be held in Kansas City Feb. 21 at the Nuehlebach Hotel. Dr. Dwight L. Wilbur, San Francisco, president of the college, will be the speaker at the luncheon (\$3). Papers which include invited guest authors are as follows:

Studies on Airway Resistance in Chronic Pulmonary Disease, Drs. Charles E. Andrews and William E. Ruth, Kansas City.

The Effect of Tachycardia on the Heart, Dr. Rene Wegria, St. Louis.

Agglutination Tests in Rheumatoid Arthritis, Drs. Robert H. Ramsey, Carlo P. Caciolo, and Jack Zuckner, St. Louis.

Specific Diabetic Vascular Lesions of the Lower Extremity, Drs. Sidney Goldenberg, Morris Alex, and Herman T. Blumenthal, St. Louis.

Erythropoietic Stimulating Factor(s) and the Anemia of Chronic Renal Disease, Drs. Neil I. Gallagher, John M. McCarthy, and Robert D. Lange, St. Louis.

Clinical Evaluation of Trimethodinium Methosulfate, Drs. James G. Janney Jr., Carlo P. Caciolo, S. R. V. Reddy, A. K. Simonidis, and George Duane, St. Louis.

The dinner (\$7.50), to which ladies and guests are invited, will be held at 8 p. m.

Personal.—Don A. Livingston, Ph.D., St. Louis, has been appointed business manager of the Catholic Hospital Association of the U. S. and Canada.—Dr. Robert L. Jackson, chairman, department of pediatrics, University of Missouri School of Medicine, Columbia, was elected president-elect of the Missouri Diabetes Association at a meeting of the association council held recently at the University Medical Center.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

NEW JERSEY

Lecture on Sterilization-Irradiation.—"New Horizons in Sterilization-Irradiation" will be the subject of a lecture by L. E. Gordon, Ph.D., of Ethicon, Inc., at the third of the 1958-59 Becton, Dickinson Lectures to be held Feb. 27, 4-5 p. m., in Murdoch Hall, Seton Hall College of Medicine and Dentistry, Jersey City. The lectures, established last fall under a grant from Becton, Dickinson and Company, manufacturers of medical instruments, have brought *scientists to the Seton Hall campus to lecture on various sterilization techniques*. The lecture will be open to all with a professional interest in the subject.

Dr. Henderson Wins Book Award.—Dr. John Henderson, New Brunswick, Johnson & Johnson's medical director, received the "Maggie" award given annually to authors and publishers by the Mid-America Periodical Distributors Association for "editorial excellence." His book, "A Parents' Guide to Children's Illnesses," co-winner, was one of two awards in the category of "Arts, Crafts, How-To, Special Interests." Dr. Henderson's prize was the "Medallion of Merit" in the 1958 competition. The "Maggie" awards are designed to call public attention to the best in periodicals and paperback books and to give editors and publishers additional incentive to continue improving their product.

NEW YORK

New York City

Mental Health Clinic for Children.—The Catholic Home Bureau for Dependent Children has established a mental health clinic for children with emotional problems in foster homes supervised by the agency, according to the Rev. G. Howard Moore, executive director. He announced that the clinic, which opened formally Jan. 5, provides psychiatric and psychological services for the more than 1,200 children who have been placed in foster homes throughout the Archdiocese of New York and in the Long Island Dioceses. The staff of the new clinic includes Dr. Lois Bellinger de Alvarado, psychiatrist associated with the home bureau for more than two years; Raymond Strassburger, Ph.D., clinical psychologist; and Sister Benedicta of the Daughters of Charity, psychiatric social worker. The new clinic is located at the Catholic Home Bureau's offices in the Catholic Charities Center, 122 E. 22nd

St. The agency, which also operates an adoption department, is one of the 36 child-care affiliates of New York Catholic Charities.

PENNSYLVANIA

Personal.—The Industrial Hygiene Foundation, Pittsburgh, announced the election of William P. Yant, director of research and development at Mine Safety Appliances Company, as chairman, Board of Trustees, and the appointment of Helmuth H. Schrenk, Ph.D., research director of the foundation since 1949, as managing director to succeed Dr. Charles R. Walmer, who is returning to private medical practice.—Dr. R. James Herron, of Monessen, was named medical director of Pittsburgh Steel Company. He moves up from the position of assistant medical director to succeed his late father, Dr. Thomas B. Herron, who died Dec. 3. Dr. Herron will continue to make his headquarters at Monessen Works.

Philadelphia

Dr. Flesch Wins Psoriasis Award.—The department of dermatology, Baylor University College of Medicine, Houston, Texas, announced that Dr. Peter Flesch, department of dermatology, University of Pennsylvania, has been selected as the recipient of the \$1,000 International Award for Research in Psoriasis. The award is given "for his many contributions and continued activity in psoriasis research." Drs. Marcus R. Caro, Edward P. Cawley, Arthur C. Curtis, Eugene M. Farber, John M. Knox, Aaron B. Lerner, and Carl T. Nelson comprised the selecting committee. This award was established by Carol and Henry J. N. Taub in honor of their grandparents, Mr. and Mrs. J. N. Taub.

Annual Postgraduate Institute.—The 23rd Postgraduate Institute conducted by the Philadelphia County Medical Society will be held March 17-20 in the Bellevue-Statford Hotel. Guest speakers will be Dr. Julian M. Ruffin, Duke University Hospital, Durham, N. C., who will speak on "Management of Idiopathic Steatorrhea"; Dr. Harold A. Zintel, St. Luke's Hospital, New York City, on "Handling of Acute Abdominal Injuries"; Dr. James R. Gallagher, Children's Medical Center, Boston, on "Problems of the Teenager"; and Dr. Perry J. Culver, Massachusetts General Hospital, Boston, on "Mechanisms of Malabsorption Syndromes." The morning session, March 17, will include a symposium on cancer. The program is accepted for category I credit by the American Academy of General Practice. For information write Dr. C. Wilmer Wirts, 301 S. 21st St., Philadelphia 3, Director.

RHODE ISLAND

Hospital News.—Dr. Chester M. Jones, professor of clinical medicine, emeritus, Harvard Medical School, and consulting visiting physician at the

Massachusetts General Hospital, Boston, will serve as physician-in-chief pro tempore at the Rhode Island Hospital Feb. 16, 17, and 18.

TEXAS

Society News.—The new officers of the Texas Academy of General Practice are: Dr. Charles E. Oswalt Jr., of Fort Stockton, president; Dr. Jack M. Partain, of San Antonio, vice-president and chairman of the board of directors; Dr. E. Sinks McLarty, Galveston, president-elect; and Dr. L. W. Johnson, of Houston, treasurer.

WASHINGTON

Dr. Rushmer Wins Cardiovascular Award.—Dr. Robert F. Rushmer, professor of physiology and biophysics, University of Washington School of Medicine, Seattle, was named winner of the Ida B. Gould Memorial Award for Research on Cardiovascular Problems. The announcement was made by Dr. Paul Dudley White, chairman of the selection committee for the award. The award, supported by the Richard and Hinda Rosenthal Foundation, was instituted in 1956, and is given "for outstanding accomplishment in heart research" annually by a committee representing the Helen Hay Whitney Foundation, the Life Insurance Medical Research Foundation, the Rosenthal Foundation, the American Heart Association, and the National Heart Institute. Previous winners have been Drs. C. Walton Lillehei and Richard DeWall, Minneapolis, and Dr. Irvine H. Page, Cleveland.

Personal.—Four members of the University of Washington School of Medicine staff have recently been appointed to advisory committees of the National Institutes of Health. Dr. H. Stanley Bennett, executive officer of the department of anatomy has been named to the National Advisory Health Council; Hans Neurath, Ph.D., of the department of biochemistry, to the Biochemistry Training Grant Committee; Dr. K. A. Arelius Merendino, department of surgery, to the Surgery Study Section; and Dr. Charles A. Evans to the National Advisory Cancer Council.—Dr. John C. Sherris has been appointed director of the microbiology division of the laboratory of the University of Washington Hospital, Seattle, and associate professor of microbiology, effective March 1. Previously, Dr. Sherris held a position in the department of bacteriology at the University of Manchester, England.

WISCONSIN

University News.—Dr. C. N. deVerdier, of Sweden, is the first fellow to visit the University of Wisconsin Medical Center, under the new U. S. Public Health Service Post-Doctoral Fellowship Program which provides for the award of a limited number of fellowships to highly qualified scientists from

outside the United States to work in medical laboratories in this country. Dr. deVerdier has joined the staff of the McArdle Laboratories where he will work under the direction of Van R. Potter, Ph.D.

GENERAL

Awards for Papers on Obstetrics and Gynecology.—The Division of Obstetrics and Gynecology of the International College of Surgeons announced its second annual competition for two awards for the best manuscripts on a phase of obstetrics and gynecology. The first award will be \$500 and the second \$300. The contest is limited to (1) interns, residents, or graduate students in obstetrics and gynecology, or (2) to those engaged in the practice or teaching of the specialty. Contestants must hold a degree of medicine from an accredited college of medicine. Fellows of the International College of Surgeons are not eligible. Manuscripts of not more than 5,000 words must be submitted on or before June 1, 1959, to Dr. Harvey A. Gollin, secretary of the prize committee, 55 E. Washington St., Chicago 2. For information on contest rules, write to Dr. Gollin.

Clinical Scientists Meeting in Alabama.—The 15th meeting of the Association of Clinical Scientists will be held Feb. 26-March 1 with headquarters at the Holiday Inn and Isle Dauphine Club, Dauphin Island, Mobile Bay, Mobile, Ala. The opening session Feb. 26 will include the following topics:

Kolf Twin Coil Artificial Kidney.
Coulter Electronic Counter.
Cytology of the Uterine Cervix.
Radioisotope Equipment.
Autoanalyzer.

Speakers will include Morris Schaeffer, Ph.D. Montgomery, Ala.; Dr. George D. Webster, Miami, Fla.; Dr. Benjamin Branscome, Birmingham, Ala.; Marion Hodd, Ph.D., New Orleans; Dr. Warren Bell, Jackson, Miss.; Dr. Joseph Dingman, New Orleans; Dr. Hershel V. Murdaugh, Birmingham; and Dr. Robert H. Holmes, Washington, D. C. Exhibits are planned, and the annual business meeting will be held the morning of March 1. For information write the Association of Clinical Scientists, Mobile Infirmary, P. O. Box 4097, Mobile, Ala.

Blindness Among Children.—According to the statisticians of the Metropolitan Life Insurance Company, not only has blindness due to infectious diseases decreased sharply among school-age children, but loss of sight due to the administering of oxygen in high concentration to premature infants has become rare. A report by the statisticians delineating features of the current picture on blindness includes the following:

Persons in the United States who are either totally blind or with impairment of vision sufficiently great to prevent normal activities number 345,000, which is at the rate of 2 per 1,000 of the population. New cases are estimated at 30,000 yearly, or 17 per 100,000 population.

Slightly more than half of these blind are 65 years of age or over, about 30% are between ages 40 and 64, 12% between 20 and 39, and 7% under age 20.

The most frequent causes of blindness generally have their onset in middle and later life, and include specific eye conditions of unknown etiology, particularly glaucoma and cataract, and such general disorders as arteriosclerosis, high blood pressure, nephritis, and diabetes.

Males have a higher blindness rate than females, which results in part from the higher incidence among males of blindness due to accidents and to the earlier development of arteriosclerotic and other degenerative changes.

Essay Contest in Physical Medicine.—The sixth essay award, sponsored by the American Congress of Physical Medicine and Rehabilitation "to stimulate interest in the field of physical medicine and rehabilitation," has been announced. The contest, while open to anyone, is primarily directed to interns, residents, graduate students in the preclinical sciences, and graduate students in physical medicine and rehabilitation. The following rules apply:

Any subject of interest or pertaining to physical medicine may be submitted.

Manuscripts must be in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, not later than March 2.

The essay must not have been published previously.

The congress shall have the exclusive right to publish the winning essay in its official journal, the *Archives of Physical Medicine and Rehabilitation*.

Manuscripts must not exceed 3,000 words, with the number of words stated on the title page. An original and one carbon copy must be submitted.

The winner shall receive a cash award of \$200.

All manuscripts will be returned as soon as possible.

The American Congress of Physical Medicine and Rehabilitation reserves the right to make no award if, in the judgment of the Essay Award Committee, no contribution is acceptable. Announcement of the winner will be made at the annual meeting.

Awards for Reporting on Heart Diseases.—The opening of the seventh annual competition for the Howard W. Blakeslee awards for "outstanding reporting" in heart and blood vessel diseases has been announced by the American Heart Association. Selections from among newspaper and magazine articles, books, radio and television programs, and films published or produced between March 1, 1958, and Feb. 28, 1959, will be made by the association's Blakeslee Awards Committee. May 1 will be the deadline for entries. Entries submitted by local newspapers and radio and television stations will be considered on the same basis as entries from national wire services, syndicates or radio-TV networks, and they will be eligible for awards in separate categories. The number of winners to be selected will be determined by the judges. The awards carry an honorarium of \$500 each. Entry blanks and rules folders may be obtained from local heart associations or from the American Heart Association, 44 E. 23rd St., New York 10. The awards were established by the heart association in 1952 as a memorial to the late Howard W. Blakeslee, Associated Press

science editor and a founder of the National Association of Science Writers, who died of heart disease in 1952.

Essay Award for Medical Students.—The Bernard M. Baruch Essay Award, sponsored by the American Congress of Physical Medicine and Rehabilitation, has been announced. The annual award of \$100 will be given as a prize for an essay on any subject relating to physical medicine and rehabilitation. The following rules and regulations apply:

Any subject of interest or pertaining to physical medicine and rehabilitation may be submitted.

Manuscripts must be in the office of the American Congress of Physical Medicine and Rehabilitation, 30 N. Michigan Ave., Chicago 2, not later than March 2.

Contributions will be accepted from medical students only. The American Congress of Physical Medicine and Rehabilitation shall have the exclusive right to publish the winning essay in its official journal, the *Archives of Physical Medicine and Rehabilitation*.

Manuscripts must not exceed 3,000 words, with the number of words stated on the title page. An original and one carbon copy must be submitted.

The essay must not have been published previously.

The winner shall receive a cash award of \$100.

All manuscripts will be returned as soon as possible. The winning manuscript becomes the exclusive property of the congress.

The American Congress of Physical Medicine and Rehabilitation reserves the right to make no award if, in the judgment of the Essay Award Committee, no contribution is acceptable. Announcement of the winner will be made at the annual meeting.

Charles F. Kettering Dies.—The engineer who contributed the self starter, ethyl gasoline, and high compression engines to the automotive age, Charles Franklin Kettering, died in Dayton, Ohio, a few days before Thanksgiving, aged 82. In an article that was written on the occasion of the 75th anniversary of THE JOURNAL, he summed up the sense of kinship he felt for the medical profession: "... we must break down the boundaries between engineering and medicine ... all of us, all the professions are a part of one big work banding together to fight for every form of human progress." In the autumn of 1931, Mr. Kettering and a pathologist, a general practitioner, and a writer met and developed the air-conditioned hypertherm for use in the fever-arsenic treatment of early contagious syphilis. Since retirement from the active directorship of General Motors research a dozen years ago, his time was devoted chiefly to three consuming interests. One was the Sloan-Kettering Institute, which he and G. M. Chairman-of-the-Board Alfred P. Sloan established for cancer research. A second became known as his "why the grass is green" investigation into the fundamental mechanism of the storage of solar energy by plants. The third interest he had pursued for more than 50 years, a wonderment on the mystery of how a magnet can exert a pull on another object through space.

World Population Increases Forty-Seven Million.—The Population Reference Bureau, Inc., Washington, D. C., announced that a "country" almost the size of Italy was added to the world's population in the past 12 months, according to the latest United Nations figures. There were about 108 million births and 61 million deaths during 1958, making a net addition to the world's population of 47 million. In American terms, the world's increase in 1958 exceeds the total population of all the New England states plus that of New York, New Jersey, Pennsylvania, and Maryland. The bureau, a nonprofit research organization which assembles population data and trends, notes that the most recent United Nations figures on current population distribution and relative growth rates for the year 1957 show the world population increased by 11.8%, that of Asia by 12.5%; Europe, 5.3%; Africa, 12.6%; Russia, 12.5%; North America, 11.9%; South America, 18.4%. By nations, the biggest gainers for the year were China, adding about 15 million people; India adding about 6 million; the USSR, 3.6 million. The United States ranked fourth with a net gain of 2.6 million. About one-third of the present world population—nearly one billion people—now live within the Communist orbit. For 1959, the bureau foresees an additional 110 million births in the world, with a net gain of nearly 50 million persons. If this trend continues, the bureau forecasts, world population will be a little over 4 billion people by 1980.

Decrease in Catastrophes in 1958.—Catastrophes—accidents in which five or more persons are killed—caused nearly 1,600 deaths in 1958, about 100 fewer than in the preceding year, it is reported by statisticians of the Metropolitan Life Insurance Company. While there were 10 major catastrophes which took at least 25 lives each, for the first time since 1949 no single disaster caused as many as 100 deaths. Closest to this figure was the fire that swept a Chicago school Dec 1, killing 93 persons—90 children and three nuns. Four major disasters involved aircraft. The highest toll in a railroad accident in the U. S. since 1951 was the 48 lives lost when a passenger train plunged into Newark Bay near Bayonne, N. J., Sept. 15. Two other disasters also were associated with transportation: a school bus plunged over a cliff into a river near Prestonsburg, Ky., on Feb. 28, drowning 27, all but one of them children; and in November, a freighter sank in Lake Michigan, accounting for 33 fatalities. The only natural disaster of the year was a group of tornadoes which hit northwestern Wisconsin early in June, claiming 30 victims. The other major catastrophe, involving the sale of poisonous liquor in New York City, took 27 lives. Catastrophes involving motor vehicles accounted for more than one-fourth of the lives lost in all accidents in which five or more persons were killed during the year. Fires and explosions ranked next. Military and civil aviation were responsible

for a larger number of catastrophic deaths in 1958 than in 1957, as was true of fires and explosions, water transportation, and railroads. The loss of life in natural catastrophes was the lowest since 1951.

Grants for Muscular Dystrophy.—New allocations totaling \$420,815 have been made by Muscular Dystrophy Associations of America, Inc., for research studies in muscular dystrophy and related disorders in 35 universities here and abroad. Eight of the Muscular Dystrophy Associations of America-sponsored grants will support new projects and twenty-six are grant renewals. Also included is a postdoctoral fellowship carrying a stipend of \$6,000, awarded to a Swedish woman doctor, Dr. Ingrid Gamstorp, who will work at the University of Utah. It is one of two Jerry Lewis fellowships recently set up by the association to honor its national chairman. The grants cover support to investigators in France, Switzerland, Israel, and England, as well as in 31 U. S. universities. The largest of the new grants, for \$20,404, is for a project under the direction of Pinckney J. Harman, Ph.D., chairman of the department of anatomy, Seton Hall College of Medicine and Dentistry in New Jersey. The Muscular Dystrophy Associations of America's over-all research program includes support of 97 projects located in nearly 60 medical centers in this country and in 10 institutions abroad. This program will be strengthened and furthered by the Associations' 11-story 5-million-dollar Institute for Muscle Disease nearing completion in New York City. It is scheduled to be ready for operation in April, 1959. In addition to medical research, the Muscular Dystrophy Associations of America also sponsor, through about 350 affiliated chapters, a network of 49 muscular dystrophy clinics and a variety of patient services, including improved education, recreation, and summer camping for dystrophic children.

Society News.—Dr. Roy M. Hoover has been re-elected president of the American Board for Certification of the Prosthetic & Orthopedic Appliance Industry, Inc. Serving with him on the board for the year ahead will be Mr. W. Frank Harmon, orthotist of Atlanta, Ga., who was elected vice-president and these directors: Dr. Vernon L. Nickel, Los Angeles; Dr. Eugene E. Record, Boston; Mr. Howard Thranhardt, prosthetist of Atlanta; Herbert Hart, orthotist of Oakland, Calif. The three physician members of the board serve by nomination of the Executive Committee of the American Academy of Orthopaedic Surgeons. The board conducts annual examinations for the certification of prosthetic and orthopedic technicians, who can produce evidence of satisfactory service for a minimum period of four years.—The Mississippi Valley Conference has installed the following officers: president, Dr.

Joseph B. Stocklen, Cleveland; president-elect, John E. Egendorf, Chicago; first vice-president, Dr. George Smiley, Ottumwa, Iowa; second vice-president, Thomas F. Mulrooney, St. Paul, Minn.; and secretary-treasurer, Gerald D. Fry, Columbus, Ohio.—The Association of Military Surgeons of the United States has installed the following officers: Brig. Gen. Harold H. Twitchell, USAF (MC), Wiesbaden, Germany, president; Rear Admiral Richard A. Kern, MC, USN, Ret., Philadelphia, first vice-president; Dr. Leroy E. Burney, Surgeon General, U. S. Public Health Service, second vice-president; Major Gen. James P. Cooney, MC, USA, third vice-president; Rear Admiral Irwin L. Norman, MC, USN, fourth vice-president; Col. Robert C. Kimberly, MC, NG, Maryland, fifth vice-president. Col. Robert E. Bitner, MC, USA, Ret., continues as secretary-editor. The 66th annual convention of the association will be held at the Mayflower Hotel, Washington, D. C., Nov. 9-11, 1959.

Report on 1958 Mortality.—In 1958, for the second year in a row, the general death rate for the United States is higher than it was in 1956, the statisticians of the Metropolitan Life Insurance Company report. The rise reportedly is due largely to widespread outbreaks of respiratory disease in the early months of 1958 which followed the epidemic of Asian influenza in the closing months of 1957. The increase, however, was moderate. The death rate for 1958 is estimated to be 916 per 1,000 population—the same as it was for 1957—which is only 2% above that for 1956 and 4% above the all-time low of 912 established in 1954. For 11 years in succession the mortality rate has been below 10 per 1,000. "The death rate from influenza and pneumonia in 1958 will approximate that for 1957," the statisticians note. "The mortality from these causes in the two years is the highest in about a decade, but is still less than half the level prevailing in the immediate pre-World War II years, prior to the widespread use of sulfa drugs and the antibiotics." Mortality from cancer, which accounts for almost one-sixth of all deaths, was practically at the same level in 1958 as in the preceding year, the statisticians state. Mortality from diabetes in 1958 was little changed from that in 1957. The death rate from tuberculosis decreased slightly to 7 per 100,000 in 1958. The tuberculosis death rate has dropped more than 50% in the past six years and about 75% in the past decade. The number of poliomyelitis cases in 1958 exceeds by a small margin the 5,894 cases reported in 1957. In 1955 about 29,000 poliomyelitis cases were reported, and in 1952 nearly 58,000. The 1958 infant mortality rate is about a sixth lower than that recorded 10 years ago. Maternal mortality has not changed appreciably between 1957 and 1958, remaining at about 4 per 10,000 live births.

Southern Education Board Forms Mental Retardation Panel.—The Southern Regional Education Board through sponsorship by its Mental Health Program has announced the formation of a Panel on Mental Retardation which will "advise and assist staff of the board in determining ways and means whereby professional and technical training and research in the field of mental retardation can be increased and improved." In general, activities will consist of the following:

Continuing assessment of the research, and the professional and technical training needs of the field.

Identification of promising practices in meeting these needs. Formulation of various solutions to problems blocking the meeting of needs.

Obtaining action in implementing recommended solutions.

Members of the Panel are: Dr. Lloyd Dunn, George Peabody College for Teachers, Tenn.; Dr. Arleigh L. Lincoln, Raymond A. Kent School of Social Work, University of Louisville, Ky.; Dr. Benedict Nagler, Lynchburg Training School and Hospital, Virginia; Dr. Harry B. O'Rear, Medical College of Georgia, Augusta; Dr. William Sloan, State Colony and Training School, Louisiana; Dr. John Vasconcellos, Rosewood State School, Maryland, and Mr. Raymond W. Vowell, Board of State Hospitals and Special Schools, Texas. Plans are under way for a survey of needs in the Southern region, including research, trained personnel, practices, and mental health provisions. This survey is expected to be completed by early 1959. Other activities of the Mental Health Program consist of sponsorship of a series of research conferences and the administration of a grant from the National Institute of Mental Health for the purpose of allowing personnel of mental institutions to study new ways of doing their job. A Program for Teachers of Exceptional Children, a unit of the board, is engaged in assisting states in recruiting and training more qualified teachers of the retarded, and assists states in forming cooperative arrangements to pool resources in developing centers for doctoral training.

FOREIGN

International Symposium on Toxic Substances.—The International Symposium on Maximum Allowable Concentrations of Toxic Substances in Industry will be held at Prague, Czechoslovakia, April 14-17, 1959. The symposium will be arranged under the aegis of the Permanent Committee and International Association on Occupational Health and the International Union of Pure and Applied Chemistry. The following subjects will be treated:

The investigation of present-time definition and conceptions of maximum allowable concentrations in different countries. The evaluation of present-time methods and procedures used in different countries for the determination and fixing of maximum allowable concentrations.

Maximum allowable concentrations in biological materials. The evaluation of the importance of suitable methods of chemical analyses, physical methods, and methods of sampling used in industry.

General discussion.

President of the Organizing Committee is Prof. Rene Truhaut, Paris, and General Secretary is Prof. J. Teisinger, Karlovo N. 33, Prague II.

LATIN AMERICA

Symposium on Cardiovascular Diseases in Colombia.—The first Symposium on Cardiovascular Diseases, sponsored by the Shaio Foundation, will be held July 27-31 at the Hotel Tequendama, Bogota, Colombia. Invited participants include physicians from Canada, England, Sweden, Mexico, France, and the United States. The scientific program will include round-table discussions and the following schedule of topics:

Monday—10 a. m.-12 noon (1) Pulmonary Hypertension.

5-7 p. m. (2) Surgical Congenital Heart Diseases.

Tuesday—10 a. m.-12 noon (3) Coronary Diseases.

5-7 p. m. (4) Valvular Diseases.

Wednesday—10 a. m.-12 noon (5) Aortic Aneurysms.

5-7 p. m. (6) Extra Corporeal Circulation and Hypothermia.

Thursday—10 a. m.-12 noon (7) Correlation Between Electrocardiography, Angiocardiography and Other Methods of Examination as Diagnostic Measures.

5-7 p. m. (8) Free Subjects.

Registration fee is \$50. The Shaio Foundation is a private nonprofit organization supported by funds provided by the Shaio family, owners of a textile plant in Bogota. It is dedicated to the diagnosis and treatment of cardiovascular diseases, which work was begun in December, 1957. For information write the Fundacion A. Shaio, Clinica: Carretera De Suba, Bogota, Colombia.

CORRECTIONS

Effect of Digitalis on Exertional Dyspnea.—In the article by Gold et al., in *THE JOURNAL*, Jan. 17, 1959, the word "digitoxin" in the 13th line from the top of the left-hand column on page 231 should have read "digoxin" (Lanoxin).

Voluntary Health Insurance for Aged.—In the "Highlights of the 12th Clinical Meeting" in the Organization Section of the Dec. 20, 1958, issue of *THE JOURNAL*, page 2148, the statement that "for the group over 65 with modest resources or low family income . . . physicians agree to accept a level of compensation as full payment for medical service rendered to this group" is quoted from a reference committee report which later was modified. In the official action of the House of Delegates, the phrase "as full payment" was deleted from the report, which then was adopted.

Postpartum Lactation.—In the article entitled "Lactation Inhibition by Deladumone Injected During Labor or Just After Delivery" by Watrous and co-work-

ers in the Jan. 17, 1959, issue of THE JOURNAL, pages 246-249, the organization of table 1 is incorrect. The corrected version of this table is given below.

Group, No.	No. of Cases	Steroid Hormone Preparation	Dosage	No. of Cases with Breast Manifestations, Grouped by Grade									
				0		1		2		3		4	
				No.	%	No.	%	No.	%	No.	%	No.	%
1.....	42	None	No Treatment	1	2.4	2	4.8	10	23.8	18	42.8	11	26.2
			Given ½ to 8 Hr. After Delivery										
2.....	83	Tylosterone	1 tablet, 3 times a day	36	43.4	22	26.5	18	21.7	7	8.4	0	0
3.....	27	Deladumone	2 cc.	5	18.7	6	22.5	8	29.9	6	22.9	0	0
4.....	55	Deladumone	3 cc.	29	52.7	19	34.6	7	12.7	0	0	0	0
			Given ½ to ½ Hr. After Delivery										
5.....	10	Deladumone	2 cc.	3	30	2	20	3	30	2	20	0	0
6.....	22	Deladumone	3 cc.	13	59.1	6	27.3	3	13.6	0	0	0	0
7.....	18	Deladumone	4 cc.	12	66.7	4	22.2	2	11.1	0	0	0	0

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral.* Phoenix, April 5-10. All applications already on file. Sec., Dr. Forrest E. Leffingwell, 217 Farmington Ave., Hartford 5, Conn.

AMERICAN BOARD OF DERMATOLOGY: *Written.* Several Cities, Oct. 5. *Oral.* Oklahoma City, Jan. 15-18, 1960. The final date for filing all applications is July 1, 1959. Sec., Dr. Beatrice M. Kesten, One Haven Ave., New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: 1959 *Schedule—Written*, Oct. 19. Final date for filing application is May 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application was Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology.* Philadelphia, April 17-18. Final date for filing application was Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *I. Oral and Clinical.* Chicago, May 8-19. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates. Candidates who participated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible. Deadline for receipt of new and reopened application for the 1960 examinations is Aug. 1, 1959. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* (Part II) Philadelphia, June 2-6; St. Louis, Oct. 6-10. *Written* (Part I), Jan. 25, 1960. Application for 1960 must be filed before July 1, 1959. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I.* Washington, D. C., Denver, Colorado and Rochester, Minn., Mar. 26-27. Deadline for filing application was Nov. 30. *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* Chicago, Oct. 5-9. Final date for filing application is February. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PATHOLOGY: Boston, April 16-19. Final date for filing application is Feb. 28. Sec., Dr. Edward B. Smith, 1100 W. Michigan St., Indianapolis 7.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Written, Part I, and Oral, Part II.* Philadelphia, June 12-13. Final date for filing application is February 15. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral and Written.* Miami, Fla., Oct. 15-17. Final date for submitting case reports is July 1. Corresponding Secretary, Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8, Mo.

AMERICAN BOARD OF PREVENTIVE MEDICINE: *Written. Public Health.* Regional, Apr. 9-11. *Occupational Medicine.* Chicago, Apr. 17-19. *Aviation Medicine.* Los Angeles, Apr. 24-26. Final date for filing application for all three examinations is Jan. 15. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

AMERICAN BOARD OF PROCTOLOGY: *Oral and Written.* Philadelphia, September. Final date for filing application is March. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New Orleans, Mar. 16-17; Chicago, Oct. 19-20; New York, Dec. 14-15. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 was terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Special Examination.* Cincinnati, Mar. 16-19, 1959. Final date for filing application was Nov. 1. *Examination.* Chicago, June 2-4. If needed a special examination will be offered at this time in Nuclear Medicine to diplomates in Radiology or Therapeutic Radiology. The deadline for filing applications is April 1. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written examinations* (Part I) will be held on December 2, 1959 at various centers to be announced later. Candidates are urged to apply several months before completion of training requirements although the closing date for filing applications is August 1. Those completing training requirements after September 30 cannot be considered for the Part I examination in December of the same year. *Part II.* Durham, N. C., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

BOARD OF THORACIC SURGERY: *Oral.* Los Angeles, April. Final date for filing application is Dec. 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

AMERICAN BOARD OF UROLOGY: The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

GOVERNMENT SERVICES

NAVY

Space Medicine Award.—Capt. Charles F. Gell, M. C., U. S. Navy, was presented the Melbourne W. Boynton Award for Space Medicine at the Honor's Night Dinner of the American Astronautical Society's Annual Meeting in Washington, D. C., in December. The presentation was made by Rear Adm. Edward C. Kenney, M. C., U. S. Navy. The society presents this award at the end of each year to the person who has made an outstanding contribution to astronautics through medical research. Captain Gell was chosen for his work in the fields of multicrew long duration confinement and explosive decompression of mammals.

Personal.—At the Southern Regional Meeting of the International College of Surgeons in Miami, in January, Rear Adm. Bartholomew W. Hogan, the Navy surgeon general, presented a paper entitled, "Medical Problems of Nuclear Warfare Defense and Civil Disaster." Capt. Carl E. Wilbur, M. C., U. S. Navy, and Capt. Murray W. Ballenger, M. C., U. S. Navy, have been elected chairman and secretary, respectively, of the Joint Committee on Aviation Pathology for 1959. The committee, which includes medical officers of the military services of the United States, the United Kingdom, and Canada, held its fifth business meeting at the Armed Forces Institute of Pathology in December.

VETERANS ADMINISTRATION

Neuropsychiatric Symposium.—The Eleventh Annual Institute in Psychiatry and Neurology will be held at the Veterans Administration Hospital, North Little Rock, Ark., on Feb. 26 and 27. Participants in this institute will include Dr. Kenneth E. Appel, Ardmore, Pa., past-president, American Psychiatric Association; Dr. Leo H. Bartemeier, Seton Institute, Baltimore, Md., past-president, American Psychiatric Association; Dr. Dexter M. Bullard, Chestnut Lodge, Rockville, Md.; Dr. Francis J. Certy, president, American Psychiatric Association, Chicago; Dr. J. McV. Hunt, Department of Psychology, University of Illinois, Urbana, Ill.; Dr. Bernard I. Kahn, chief, Department of Psychiatry, Permanente Medical Group, San Francisco; Dr. Edith M. Lentz, associate professor, School of Public Health, University of Minnesota, Minneapolis; Dr. G. Wilse Robinson, Neurological Institute, Kansas City, Mo.;

Dr. Mathew Ross, medical director, American Psychiatric Association, Washington, D. C.; Dr. Stewart Wolf, Oklahoma City; and others. Dr. Leo H. Bartemeier will present the principal address at the dinner session Thursday evening, Feb. 26. On Wednesday, Feb. 25, there will be special conferences in clinical psychology, psychiatric social work, psychiatric nursing, and psychiatric aspects of recreation. Dr. Harold W. Sterling, manager of the hospital, cordially invites interested professional personnel to attend the institute; there will be no charge for registration.

PUBLIC HEALTH SERVICE

Radioactivity in Milk.—Although levels of strontium-90 in milk increased during September in 8 of 10 sampling stations across the country, the increases generally were within the range of recent month-to-month fluctuations in radiation levels among the different sampling stations. All samples remained well below the levels currently considered by the National Committee on Radiation Protection and Measurements to be permissible for consumption over an entire lifetime. Compared with the levels of last June, four stations showed an increase and four showed a decrease. The sampling network was expanded to include eight stations in June, and two have been added since then. While much more research is needed on the specific health effects of various types and degrees of radiation, the National Committee on Radiation Protection and Measurements currently considers that a lifetime of exposure to strontium-90 at an average level of 80 micromicrocuries per liter should not cause appreciable bodily injury to a person. In addition to measuring strontium-90, the milk sampling network also measures iodine-131, strontium-89, barium-140, and cesium-137 in milk. The levels for these elements also have shown a generally variable pattern even further below the current permissible levels.

Decline in Births.—For the first time since 1950, the number of children born in the United States apparently decreased in 1958. National Office of Vital Statistics records indicate that about 4,248,000 babies were born in 1958, a decline of 53,000 or 1% from the record high set in 1957. Fewer marriages in 1957, when the marriage rate dropped 4% from the previous year, may account for the estimated decrease. There were an estimated 1,151,000 first-born children in 1958 compared to 1,164,000 in 1957.

DEATHS

Abernathy, Shields ® Memphis, Tenn.; Vanderbilt University School of Medicine, Nashville, Tenn., 1907; member of the American Radium Society; fellow of the American College of Surgeons and the International College of Surgeons; served overseas during World War I; formerly on the faculty of the University of Tennessee College of Medicine; served on the staffs of the Baptist Memorial Hospital, where he was at one time chief of staff, Methodist and St. Joseph hospitals; died Nov. 28, aged 72.

Alexander, I. Hope, Pittsburgh; born in Kennett Square, Pa., Sept. 30, 1879; University of Pennsylvania Department of Medicine, Philadelphia, 1906; an associate member of the American Medical Association; for many years director of the health department; in 1956 the Pennsylvania Public Health Association presented its annual award of merit to him; was active in the campaign for the revision of Pennsylvania milk laws, smoke prevention, and health and x-ray surveys in Allegheny County; in 1931 president of the Allegheny County Medical Society; during World War I served as chief medical officer of a government hospital in North Carolina; formerly professor of physical diagnosis in the school of dentistry of the University of Pittsburgh; served as president of the Pittsburgh chapter of the Izaak Walton League of America; served as chief of the medical staff of Passavant Hospital, where he died Nov. 9, aged 79.

Aries, Philip Lazarus ® Chicago; University of Illinois College of Medicine, Chicago, 1923; professor of pediatrics at the Chicago Medical School; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; treasurer of the Chicago Pediatric Society; associated with Cook County Hospital and the Mount Sinai Hospital, where he died Dec. 10, aged 60.

Arons, Isidore Arthur ® New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1916; member of the Radiological Society of North America and the Industrial Medical Association; served on the staffs of the Kings County and Unity hospitals; director of the department of radiation therapy at Harlem Hospital; died Nov. 10, aged 68.

Axtell, Clayton Morgan ® Deposit, N. Y.; Cornell University Medical College, New York City, 1909; for many years health officer; veteran of World

War I; on the courtesy staff of the Read Memorial Hospital in Hancock; died in the Binghamton (N. Y.) City Hospital Nov. 25, aged 72.

Baker, William Jesse ® Chicago; born in Dallas City, Ill., May 1, 1894; Rush Medical College, Chicago, 1925; clinical professor of urology at University of Illinois College of Medicine; served as professor of urology at Northwestern University Medical School; specialist certified by the American Board of Urology; member of the American Association of Genito-Urinary Surgeons and the American Urological Association, of which he was past-president, and at one time secretary-treasurer of the North Central Branch; past-president and vice-president of the Chicago Urological Society; fellow of the International College of Surgeons and the American College of Surgeons; veteran of World Wars I and II; associated with Cook County Hospital and St. Luke's Hospital, where he died Dec. 3, aged 64.

Barnett, Nathaniel ® Woodmere, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1908; during World Wars I and II helped to organize civil defense medical units for the local Red Cross; on the staff of the Hospital for Joint Diseases, New York City; consulting physician and past-president of the medical board at St. Joseph Hospital, Far Rockaway, where he was chief of staff; died Nov. 1, aged 71.

Barron, H. Aldine, Thomaston, Ga.; Atlanta College of Physicians and Surgeons, 1913; member of the Medical Association of Georgia; served as councilman, mayor, and chairman of the county board of commissioners; died Nov. 16, aged 69.

Beiderwell, Earl R., Leoti, Kan.; University of Kansas School of Medicine, Kansas City, 1924; associated with the Wichita County Hospital; died in Pueblo, Colo., Oct. 25, aged 60.

Brundage, Walter Hammond, New Rochelle, N. Y.; Cornell University Medical College, New York City, 1910; an associate member of the American Medical Association; for many years on the faculty of his alma mater; served on the staffs of the Mount Vernon (N. Y.) Hospital, where he was chief of staff, and the New Rochelle Hospital; died in the Laconia (N. H.) Hospital Oct. 6, aged 70.

Caldwell, John Alexander ® Cincinnati; Miami Medical College, Cincinnati, 1902; formerly on the faculty of the University of Cincinnati College of Medicine; member of the founders group of the

® Indicates Member of the American Medical Association.

American Board of Surgery; member of the American Association for the Surgery of Trauma; fellow of the American College of Surgeons; past-president of the Ohio State Medical Association and the Cincinnati Academy of Medicine; served in France during World War I; associated with Cincinnati General, Christ, Bethesda, Good Samaritan, and Children's hospitals; died in the Veterans Administration Hospital Nov. 9, aged 80.

Carter, Jay Bailey @ Chicago; Rush Medical College, Chicago, 1925; formerly on the faculty of his alma mater and the University of Illinois College of Medicine; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; certified by the National Board of Medical Examiners; associated with the Augustana Hospital; co-discoverer with Dr. Arnold Luckhardt of ethylene anesthesia; author of "The Fundamentals of Electrocardiographic Interpretation"; died in the Ravenswood Hospital Dec. 6, aged 59.

Chambers, Rawley Ernest @ Brig. General, U. S. Army, retired, Austin, Texas; born in Lakeview, Ohio, May 11, 1895; Ohio State University College of Medicine, Columbus, 1926; veteran of World War I; entered the medical corps of the U. S. Army as a first lieutenant in May, 1927; retired April 30, 1955; in addition to being coordinator of seven professional divisions in the Surgeon General's Office, served as chief of the psychiatry and neurology consultants division; served as chief of the neuropsychiatric service, Brooke Army Hospital, Fort Sam Houston, Texas, and director of the department of neuropsychiatry at the medical field service school there; under his direction the child guidance clinic was created at the hospital; during World War II was commanding officer of the 12th Evacuation Hospital, 805th Hospital Center, 77th Station Hospital, 7th General Hospital, and 7th Hospital Group in the European Theater; later chief of the neuropsychiatric service, Fitzsimons Army Hospital, Denver; at the time of his retirement was chief of the professional division in the office of the Surgeon General; among his awards were the Legion of Merit, World War II Victory Medal, and Commendation Ribbon; in 1954, representative for the Section on Military Medicine, American Medical Association; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; director of mental hospitals for the state of Texas; died in the Brooke Army Hospital, Fort Sam Houston, Nov. 14, aged 63.

Clark, Cecil Whitehouse @ Newton, Mass.; Boston University School of Medicine, 1915; served on the faculty of his alma mater; formerly a trustee, Colby

College, Waterville, Maine; associated with the Newton Wellesley Hospital, where he died Nov. 11, aged 76.

Cooke, Virgil Cannon, Tampa, Fla.; Atlanta College of Physicians and Surgeons, 1907; member of the Medical Association of Georgia; for many years practiced in Atlanta, Ga., where he was on staff of the Crawford W. Long Memorial Hospital; died Nov. 10, aged 81.

Corder, Grover C., Jane Lew, W. Va.; Medical College of Virginia, Richmond, 1911; an associate member of the American Medical Association; died in Clarksburg Nov. 18, aged 74.

Doyle, Charles Peter @ Lansing, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; veteran of World War I; served on the staffs of the Edward W. Sparrow Hospital and St. Lawrence Hospital, where he died Nov. 20, aged 86.

Du Puy, Charles Meridith @ Riley, Ind.; Louisville (Ky.) Medical College, 1894; veteran of World War I; on the staff of St. Anthony's Hospital; died Nov. 18, aged 91.

Egan, Wilfred Vincent, Brooklyn; Long Island College Hospital, Brooklyn, 1914; fellow of the American College of Surgeons; served in France during World War I; during World War II received a government citation for his work in giving medical examinations to draftees; associated with Holy Family, St. Peter's, and Samaritan hospitals; died Nov. 29, aged 66.

Findley, Marcus Cooper @ Salem, Ore.; University Medical College of Kansas City, Mo., 1896; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; formerly an examiner for the World War Veterans State Aid Commission; in 1903 became a surgeon for Southern Pacific Railroad; served on the board of trustees of the Willamette University; at one time practiced in Grants Pass; died in the Salem General Hospital Nov. 13, aged 87.

Firestone, Robert Iden @ Chicago; Western Reserve University School of Medicine, Cleveland, 1944; member of the Washington State Medical Association and the American Academy of General Practice; interned at the City Hospital in Cleveland, where he served a residency; served a residency at the Illinois Eye and Ear Infirmary; co-owner of the New Riverview Hospital in Raymond, Wash.; veteran of World War II; died in Brookfield, Ill., Nov. 27, aged 37.

Gaffey, James Walter, Cedar Rapids, Iowa; Drake University College of Medicine, Des Moines, 1908; died in the Mercy Hospital Nov. 2, aged 79.

Gaines, William Dugan @ Lafayette, Ala.; Medical College of Alabama, Mobile, 1892; at one time surgeon at state prison, Atmore; died Nov. 7, aged 88.

Grier, Oliver Knight, St. Petersburg, Fla.; Hahne-mann Medical College and Hospital of Philadelphia, 1906; formerly practiced in Wilkes-Barre, Pa., where he was on the staff of the Wyoming Valley Hospital; died Nov. 8, aged 80.

Hamman, Howard Harrison @ Greensburg, Pa.; Johns Hopkins University School of Medicine, Baltimore, 1916; veteran of World War I; on the staff of the Westmoreland Hospital; died Nov. 10, aged 70.

Hierholzer, John Charles, Pittsburgh; Jefferson Medical College of Philadelphia, 1888; an associate member of the American Medical Association; member of the Association of Life Insurance Medical Directors of America; one of the organizers and in 1941 vice-president of the Knights Life Insurance Company of America and became its medical director; member emeritus of the medical section of the American Life Convention; for many years on the staffs of the Mercy Hospital and Roselia Foundling Asylum and Maternity Hospital, and physician for the Home of the Good Shepherd; died Nov. 8, aged 96.

Hill, Edgar A., Clarksburg, W. Va.; Starling Medical College, Columbus, 1892; an associate member of the American Medical Association; member of the West Virginia State Medical Association; died in St. Mary's Hospital Nov. 7, aged 92.

Hoyer, Arthur August @ Beaver Dam, Wis.; Milwaukee Medical College, 1906; died in Phoenix, Ariz., Nov. 3, aged 78.

Huddle, William Isaac, Oklahoma City, Okla.; Kansas City (Mo.) Medical College, 1905; died in the Wesley Hospital Sept. 4, aged 80.

Hullinger, John D., Poplar Bluff, Mo.; State University of Iowa College of Medicine, Iowa City, 1893; formerly practiced in Clinton, Iowa, and served as Clinton County coroner; formerly member and secretary of the U. S. Pension Examination Board of Clinton County; died Nov. 25, aged 97.

Johnson, Joseph Eggleston Jr., Elberton, Ga.; Medical College of Georgia, Augusta, 1933; member of the Medical Association of Georgia; veteran of World War II; died in the Veterans Administration Hospital, Augusta, Oct. 30, aged 53.

Jolowicz, Ernst, New York City; Universität Leipzig Medizinische Fakultät, Saxony, Germany, 1907; member of the American Psychiatric Association; died in the Lenox Hill Hospital Nov. 12, aged 76.

Joslin, Charles Loring @ Baltimore; University of Maryland School of Medicine, Baltimore, 1912; professor of pediatrics at the University of Maryland School of Medicine and College of Physicians and Surgeons, where he joined the faculty in 1920; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; for many years associated with the University Hospital, Maryland General Hospital, and the West Baltimore General Hospital; died Nov. 12, aged 70.

Lee, Emmett Lehr @ Aurora, Ill.; Rush Medical College, Chicago, 1909; during World War II a regional director of the Illinois Selective Service Commission; died in the Copley Memorial Hospital Nov. 14, aged 76.

McAllister, Oscar Orville Turner, Piedmont, Calif.; Oakland College of Medicine and Surgery, 1913; an associate member of the American Medical Association; fellow of the American College of Surgeons; on the staff of the Samuel Merritt Hospital in Oakland, where he retired as physician to the Oakland Detention Home and Alameda County Jail; a member of the staff of the Tulare-Kings Counties Hospital in Springville, where he died Nov. 17, aged 73.

McElveen, Jesse Morgan @ Brooklet, Ga.; University of Georgia Medical Department, Augusta, 1902; died in Savannah Nov. 23, aged 80.

Martin, Frank Leslie, Mullins, S. C.; Medical College of South Carolina, Charleston, 1912; a member of the board of trustees at his alma mater; president of the Marion County Tuberculosis Association; veteran of World War I; a member of the staff of the Mullins Hospital; died in the Medical College Hospital, Charleston, Nov. 9, aged 71.

Mayfield, Surry Foster, Northport, Ala.; Medical Department of Tulane University of Louisiana, New Orleans, 1896; member of the Medical Association of the State of Alabama; served as mayor of Northport, and in the state legislature; formerly assistant county health officer; died in the Druid City Hospital, Tuscaloosa, Nov. 14, aged 91.

Moore-Freshour, Ina Louise @ Norwalk, Calif.; Chicago College of Medicine and Surgery, 1914; member of the American Psychiatric Association; specialist certified by the American Board of Psychiatry and Neurology; associated with Metropolitan State Hospital; died in LaHabra Nov. 5, aged 68.

Mossman, Paul Darwin @ Medical Director, U. S. Public Health Service, retired, Seattle; Starling-Ohio Medical College, Columbus, 1912; specialist certified by the American Board of Preventive Medicine; service member of the American Medical Association; served as medical director of the city public schools; retired from the U. S. Public Health

Service Oct. 1, 1950; formerly head of medical services of state defense council; died in Albuquerque, N. M., Nov. 15, aged 71.

Motley, Samuel Dennis @ Birmingham, Ala.; Kentucky University Medical Department, Louisville, 1903; member and past-president of the staff, Birmingham Baptist Hospital; on the staffs of the East End Memorial Hospital and the South Highlands Infirmary; died in the West End Baptist Hospital Nov. 11, aged 75.

Murchison, Kenneth @ Sidney, Iowa; State University of Iowa College of Medicine, Iowa City, 1903; a staff member of the Hamburg (Iowa) Community Hospital; died in the Hand Hospital, Shenandoah, Nov. 13, aged 81.

Nelson, Lorin Gordon @ Long Beach, Calif.; University of California School of Medicine, San Francisco, 1932; fellow of the American College of Surgeons; served as police surgeon; associated with Harbor General Hospital in Torrance, Long Beach Community, St. Marv's Long Beach, and Seaside Memorial hospitals; died Nov. 9, aged 55.

Neumann, Edmund C., Milwaukee; Marquette University School of Medicine, Milwaukee, 1914; also a pharmacist; died in Oshkosh, Wis., Nov. 19, aged 78.

Newbold, Reuben Lilly, Morgan Hill, Calif.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1896; died in Gilroy Nov. 8, aged 91.

Nicholas, Charles Andrew @ Easton, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1933; interned at the City Hospital in Cleveland; veteran of World War II; on the staff of the Easton Hospital and the Betts Hospital, where he died Nov. 4, aged 50.

Norton, Thomas Joseph @ Pittsfield, Mass.; Jefferson Medical College of Philadelphia, 1905; veteran of World Wars I and II; associated with Hillcrest and Pittsfield General hospitals and St. Luke's Hospital, where he was past chief of staff, and where he died Nov. 9, aged 79.

O'Connor, Robert Emmett @ Los Angeles; St. Louis University School of Medicine, 1923; for 25 years chief physician for the Chrysler Corporation, West Coast plant, and the company's affiliate, Consolidated Steel Corporation; died Nov. 17, aged 63.

Parke, D. Davis @ Bozeman, Mont.; Indiana University School of Medicine, Indianapolis, 1939; member of the American Society of Anesthesiologists; interned at Indianapolis City Hospital, where he served a residency; formerly a resident in anesthesiology at Veterans Administration Hospital in Indianapolis and the Memorial Hospital in South

Bend, Ind.; veteran of World War II; on the staff of the Bozeman Deaconess Hospital, where he died Nov. 5, aged 44.

Paul, James Hale, Drexel Hill, Pa.; Jefferson Medical College of Philadelphia, 1911; an associate member of the American Medical Association; veteran of World War I; retired in 1955 as immunologist for the city health department in Philadelphia after serving for 33 years; died in the Presbyterian Hospital, Philadelphia, Nov. 27, aged 78.

Pearson, August Walter @ Los Angeles; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; formerly practiced in Peever and Sisseton, S. D.; a member of the South Dakota State Legislature from 1927 to 1931; on the staff of the California Lutheran Hospital, died Nov. 15, aged 78.

Pearson, Lewis Walter, Brooklyn; Bellevue Hospital Medical College, New York City, 1888; an associate member of the American Medical Association; died in the Hospital of the Holy Family Nov. 25, aged 92.

Picker, Myrtle Leah @ Larchmont, N. Y.; Columbia University College of Physicians and Surgeons, New York City, 1936; on the staff of the New Rochelle (N. Y.) Hospital; vice president of the Child Guidance Center in New Rochelle; trustee, Elmira (N. Y.) College; died Nov. 6, aged 48.

Portis, Richard Alan @ Beverly Hills, Calif.; born in Chicago April 1, 1923; Western Reserve University School of Medicine, Cleveland, 1950; interned at the Beth Israel Hospital in Boston, where he served a residency; formerly a resident at the Veterans Administration Hospital in Boston and the Veterans Administration Hospital in Framingham, Mass.; served a residency at the Hospital of the University of Pennsylvania, Philadelphia; certified by the National Board of Medical Examiners; specialist certified by the American Board of Internal Medicine; clinical instructor in medicine at the University of California School of Medicine; member of the Southern California Society of Gastroenterology; on the staffs of St. John's Hospital in Santa Monica, University of California, Cedar of Lebanon, Mount Sinai, and St. Vincent's hospitals, and the Hospital of the Good Samaritan; died in Boston Nov. 4, aged 35.

Progebin, Abraham, Hempstead, N. Y.; Long Island College Hospital, Brooklyn, 1908; served on the staff of the Jewish Hospital in Brooklyn; died in Brooklyn Sept. 1, aged 75.

Quinn, William Alexander @ Portsmouth, Ohio; George Washington University School of Medicine, Washington, D. C., 1903; veteran of World War I; formerly county coroner; emeritus member on the staff of the Portsmouth General Hospital; died Nov. 14, aged 85.

Reisner, Ethel Freund, New Rochelle, N. Y.; Universität Zürich Medizinische Fakultät, Switzerland, 1922; member of the American Psychiatric Association; died in the New Rochelle Hospital Nov. 16, aged 63.

Rose, Lucy Criddle Jones, Vineland, N. J.; Syracuse University College of Medicine, 1898; formerly practiced in New York City, where she was on the staffs of Polyclinic and Babies' Hospital; died Nov. 15, aged 86.

Scharff, Edwin Stanley, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1906; member of the Louisiana State Medical Society; veteran of World War I; for many years on the staff of the Touro Infirmary; died Nov. 21, aged 80.

Schlegel, Henry Edward @ Lake Grove, Ore.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1897; formerly practiced in Portland; died in Gladstone Nov. 5, aged 84.

Schooley, Renick Calvin @ Odessa, Mo.; Beaumont Hospital Medical College, St. Louis, 1896; past-president of the Lafayette County Medical Society; died Nov. 13, aged 86.

Singleton, Walter James @ La Crosse, Kan.; St. Louis College of Physicians and Surgeons, 1921; also a graduate in pharmacy; interned at the St. Joseph's Hospital in Denver and served a residency at the Colorado General Hospital in Denver; past-president and secretary-treasurer of the Rush-Ness Counties Medical Society; associated with the Rush County Memorial Hospital, where he served one year as chief of staff; died Nov. 7, aged 65.

Somach, Irving @ New York City; University and Bellevue Hospital Medical College, New York City, 1925; specialist certified by the American Board of Internal Medicine; veteran of World War II; honorary police surgeon; associated with University and Mount Sinai hospitals; died Nov. 28, aged 57.

Stroud, Claybourne Garfield, Flemington, W. Va.; Louisville (Ky.) and Hospital Medical College, 1908; an associate member of the American Medical Association; veteran of World War I; died in the Veterans Administration Hospital, Clarksburg, Nov. 16, aged 78.

Temple, Claude Oliver @ Chicago; Chicago Medical School, 1937; member of the American Academy of General Practice; veteran of World War II; associated with St. George Hospital, where he died Nov. 29, aged 50.

Tipton, Enoch William, Kingsport, Tenn.; University of Nashville (Tenn.) Medical Department, 1899; member of the Tennessee State Medical Association; formerly mayor of Kingsport; served as vice-

president of the First National Bank of Kingsport, vice-president of the Kingsport Federal Savings and Loan Association, as director of the Kingsport Broadcasting Company, and a director of the Kingsport Publishing Company; first president of the Kingsport Kiwanis Club, which he organized; died Nov. 9, aged 85.

Trevaskis, Albert Roy @ East Pittsburgh, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; on the honorary staff, Columbia Hospital, Wilkesburg; past-president of the Rotary Club; died Nov. 7, aged 85.

Trueblood, Donald Vaughn @ Seattle; Johns Hopkins University School of Medicine, Baltimore, 1915; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; veteran of World War I; past-president of the Seattle Surgical Society; associated with the Providence, Maynard and King County hospitals; died Nov. 11, aged 69.

Ullrich, Russell William @ Mount Clemens, Mich.; University of Michigan Medical School, Ann Arbor, 1917; member of the American Association of Railroad Surgeons; American Academy of General Practice, Association of Military Surgeons of the United States, and the Industrial Medical Association; associated with St. Joseph Hospital; died Nov. 12, aged 65.

Van Ness, Julius Mellville @ San Marcos, Texas; Memphis (Tenn.) Hospital Medical College, 1903; past-president, Hays, Blanco Counties Medical Society; veteran of World War I; died Oct. 9, aged 82.

Waring, Mary Fitzbutler, Chicago; Louisville (Ky.) National Medical College, 1898; Chicago Medical School, 1923; formerly a public school teacher; died Nov. 5, aged 86.

Wilson, John Crofford, Willcox, Ariz.; Central College of Physicians and Surgeons, Indianapolis, 1903; veteran of World War I; formerly mayor of Willcox, city health officer, county health officer, school physician, and physician for the Southern Pacific Railroad Company; died in the Tucson (Ariz.) Medical Center Nov. 11, aged 79.

Wright, Oscar Reilly, Huron, S. D.; Rush Medical College, Chicago, 1893; an associate member of the American Medical Association; died in St. John's Hospital Nov. 8, aged 90.

Woodbury, Harry Ernest @ Akron, Ohio; Western Reserve University School of Medicine, Cleveland, 1915; member of the Ohio National Guard during World War II; veteran of World War I; member of the American Academy of General Practice; on the staffs of the Akron General and Children's hospitals, and the City Hospital, where he died Nov. 3, aged 71.

FOREIGN LETTERS

AUSTRIA

Congenital Hip Dislocation.—At the meeting of the Society of Physicians in Vienna on Nov. 11, Dr. K. Chiari reported on a new surgical technique for a plastic operation on the roof of the acetabulum in patients with congenital dislocation of the hip. This operation has the advantage over that devised by Spitzzy and Lance in that a good roof formation without bone grafting is possible and the function of the hip can be normalized simultaneously. The new operation consists of an osteotomy of the pelvic girdle above the hip and of a medial displacement of the whole hip joint. A transverse narrowing results from the operation which might become a handicap in the event of a delivery. The fact that this operation has been performed in various clinics in this country as well as abroad makes it necessary to inform obstetricians about the difficulties which may arise if a patient operated on in this manner becomes pregnant.

Synthetic Oxytocin.—At the same meeting Baumgarten and Watzek stated that they studied the effect of a synthetic oxytocin (Syntocinon) on the mammary gland. The drug in the form of a nasal spray was used to prevent mastitis. It produced the normal "let down" of breast milk in all patients who had had retention of milk. The onset of the effect of the nasal spray occurred within three to five minutes after application. The drug was used 495 times in 245 patients and resulted in an increase in the milk supply by about 26%. A control series of 645 patients was given no Syntocinon. This treatment is indicated if the coming in of the milk is associated with pain, there is local retention of milk, or puerperal mastitis occurs. The best time for administration is just before the second and fifth nursing period of the day. In those patients in whom the drug was given prophylactically, formation of rhagades of the nipples rarely occurred. The drug may also be given intramuscularly.

BRAZIL

Visceral Leishmaniasis.—Dr. Victor Nussensweig (*Revista de medicina e cirurgia de São Paulo*, July, 1958) studied the sensitivity and specificity of the complement fixation reaction (CFR) in visceral leishmaniasis with tubercle bacilli antigen using a quantitative method. He concluded that the sensi-

tivity of this reaction is high, as it was negative only twice in a group of 91 patients with known leishmaniasis whose serums were tested before specific treatment was started. Serum reactivity was often high. In almost 70% of the patients the titer was greater than 1:100 (median 1:188.7). In a group of patients who were being treated when a blood sample was taken, the reaction was negative in only one. The CFR was more sensitive than the aldehyde test. In 64 patients both reactions were made simultaneously. The CFR was positive in 63 and the aldehyde test in only 36 patients. The titers of aldehyde-positive serums were significantly greater than those of the aldehyde-negative serums. The specificity of the CFR was also studied. Some low-titer reactions were observed in patients with mucocutaneous leishmaniasis and chronic trypanosomiasis. In three patients with acute trypanosomiasis the titer was high. Clinical and laboratory data, however, gave an easy differential diagnosis. A small proportion of the serums from apparently normal persons reacted with the tubercle antigen. Titers were, however, much lower than in those with leishmaniasis.

Sexual Problems in Prison.—Dr. P. A. Prado was installed as fellow of the Medical Academy of São Paulo after presenting a work on sexual problems in prison. Visits of the wives in the prison, periodical day off for prisoners to visit their homes, general measures aiming at the decreasing of libido, and the residence of the delinquents with their families in convict-settlements were among the measures proposed by Dr. Prado. He concluded that the ideal solution might be found in sexual education, technical labor, religion, music, and various kinds of entertainment.

DENMARK

Sudden, Unexpected Deaths.—Professor H. Gormsen (*Nordisk medicin*, Sept. 25, 1958) stated that barely 5% of all the deaths in Denmark are sudden and unexpected. These come under four headings according as they are due to natural causes, suicide, accident, or homicide. Under the first heading heart disease accounts for about 60% of all such deaths, and it is remarkable how many persons under 40 die of coronary thrombosis without premonitory signs. In many such cases the only warning has been abdominal pain misinterpreted as cholelithiasis, gastritis, or peptic ulcer. A growing

number of sudden, unexpected deaths are due to lung cancer. Under the heading accident, carbon monoxide poisoning is an important cause of sudden, unexpected death. About 25% of all the deaths due to this cause in Copenhagen were accidental. To reduce the frequency of such deaths, the suggestion has been made that cooking gas should be detoxicated with regard to its carbon monoxide content, but the gas authorities have objected that this would raise the cost of such gas too much.

Vaginal or Abdominal Hysterectomy?—At a meeting of the Danish Gynecological and Obstetrical Society, Drs. O. Backer and K. Kristoffersen (*Nordisk medicin*, Oct. 30, 1958) compared 99 vaginal hysterectomies (for prolapse, metrorrhagia, and small fibroids) with 110 abdominal hysterectomies (for large fibroids, inflammatory conditions, and malignant disease). A follow-up examination from one and one-half to two and one-half years after the operation on 90 of the patients with vaginal and 84 of those with abdominal hysterectomies showed that after the latter only 7 had slight, symptomless descent of the vagina. Vaginal hysterectomy on the other hand was followed by objectively demonstrable descent of the vaginal wall in 39 patients, by more or less troublesome prolapse of the vagina in 25, and by prolapse so serious as to require reoperation in 14. Another speaker argued that vaginal hysterectomy had come into favor at a time when abdominal hysterectomy could still be regarded as a comparatively risky operation, whereas it was so no longer. In a recent series of 496 consecutive abdominal hysterectomies at the Bispebjerg hospital, there had been only one operative death. Since then nearly 200 such operations have been performed at this hospital without a single death. Hence the conclusion that, though the vaginal operation may still be performed under certain conditions, the indications for it have become limited.

Periarthritis Nodosa.—In the experience of the Rigs-hospital in Copenhagen, where there have been 17 cases of periarthritis nodosa in the last 10 years, this disease is not rare and may be on the increase. Dr. Frede Bro-Rasmussen (*Ugeskrift for læger*, Nov. 6, 1958) stressed the polymorphous character of this disease, for cases can be found in every department of a general hospital, sometimes referred from one to the other in the process of diagnosis. The notion of a specific cause having been abandoned, this disease is now grouped among the collagenoses, with connective tissue changes in a great variety of organs, including the skin, heart, and kidneys. It may provoke prolonged and variable fever, a high sedimentation rate, lassitude, loss of weight, a moderate degree of neutrophilia, and hypergammaglobulinemia. The prognosis is

poor, and spontaneous recoveries are rare. The successes claimed for various symptomatic treatments may simply reflect the spontaneous remissions occurring in the course of this disease. ACTH and such 11-oxysteroids as prednisone have seemed to be effective in some patients.

Renal Biopsies.—Drs. C. Brun and F. Raaschou (*Ugeskrift for læger*, Nov. 13, 1958) classified the sequelae of over 500 renal biopsies and compared their findings with the remarkably similar findings of Kark and co-workers in Chicago. The most common sequela in the Danish series was macroscopic hematuria observed in 7.9%, followed by pain in the loins in 7%. Among the 96 cases examined post mortem within six months of the renal biopsy were 23 in which the site of the biopsy could be located (usually a circular defect on the surface of the kidney about 2 mm. in diameter). No laceration of kidney tissue was found, but in 24 cases there was a small hematoma in the fatty capsule of the kidney. Though the Danish series suggests that this operation is comparatively safe, with little risk of serious complications, its practice should be confined to those hospitals in which there is wide experience with it.

Medical Journalism.—Dr. Mogens Fog, editor of the weekly journal of the Danish Medical Association, *Ugeskrift for læger*, in *Nordisk medicin* for Nov. 20, wrote a little enviously of his colleagues in the United States and the United Kingdom where the population is so large that every specialty has its own publication. There the editor has only to present a specialist author to a group of fellow specialists or would-be fellow specialists, but in the Scandinavian countries there are only the journals of the respective medical associations, the conglomerate weekly, *Nordisk medicin*, and the various "Actas." Dr. Fog toyed with and then dismissed emphatically the notion that the problem of keeping every one up to date in every field of medicine could be solved by the issue of publications of the *Reader's Digest* type. Better to face the facts that, in the case of Denmark, the editor has to cater to a medical world of which about 33% is composed of specialists, 40 to 45% of general practitioners, and the rest chiefly of research workers. For each of these groups the discriminating editor may find something of interest.

FRANCE

Acute Radiation Syndrome.—In mid-October, due to an accident at the nuclear research center in Vinca, Yugoslavia, six persons were subjected to an estimated radiation level of 450 to 5,000 r of gamma radiation (sufficient to destroy the bone marrow). They were sent for treatment to the Hôpital Curie

in Paris, where they were found to have an acute radiation syndrome. Some of their symptoms were due to the destruction of the hematopoietic tissues, resulting in a progressive disappearance of the cellular elements of the blood. Others were caused by destruction of the digestive and respiratory mucosa complicated by infection and hemorrhage. Therapy consisted chiefly of a diet rich in vitamins, transfusions of whole blood and of concentrated erythrocytes and platelets, and antibiotics. A new treatment, the transplantation of bone marrow cells from a donor, also was tried. The immediate results were most encouraging but the future of such transplants is still unknown. A homograft or heterograft of bone marrow never succeeds in a normal laboratory animal because the graft is destroyed by the antibody producing cells. Massive irradiation, however, inhibits antibody production and therefore transplants under such conditions have a greater chance of survival. In the case of the Yugoslavian scientists the leukocyte counts after the bone marrow transplants increased from 30 to 6,000 per cu. mm. and the platelet counts from a few hundred to 165,000 per cu. mm. This effect may have been due to a hematopoietic stimulation rather than to a permanent replacement of functioning bone marrow.

INDIA

Resection in Pulmonary Tuberculosis.—J. S. Karanwal and co-workers (*Indian Journal of Surgery*, vol. 20, August, 1958) reviewed 78 consecutive resections for pulmonary tuberculosis on 75 patients (46 were male and 29 were female). The youngest patient was 9 and the oldest 50, while 50% were between 20 and 29 years of age. The type of parenchymatous disease was destroyed lung in 15, destroyed lobe in 13, cavities in 31, bronchiectasis in 7, bronchostenosis in 1, and in 6 the operation was performed after a thoracoplasty failed. Three had double indications; two had a solid focus associated with a cavity; and the third had a cavity and bronchostenosis. The incidence of destroyed lung or lobe and cavities was higher in females than in males and there was no bronchiectasis in females. The more severe forms of the disease were more commonly seen in females. All had received prolonged medical treatment which failed to arrest the disease. Only 25% did not show any disease in the residual lung on plain roentgenograms; 50% had negative sputum preoperatively and only four were operated on within the original continuous antimicrobial treatment. Seventeen of the 31 patients with cavities and 3 of the 6 in whom thoracoplasty had failed had open cavities and positive sputum. The operations included 25 pneumonectomies, 45 lobectomies, and 8 segmental resections. Four were emergencies; one for recurrent hemoptysis and three for toxemia. Of the fe-

males, none had a segmental resection; 13 of the 25 pneumonectomies were performed on females and 12 on males. Thus more females had the more serious procedures performed on them. Three patients had two resections each, the second operation being performed for a bronchopleural fistula.

In only 35 patients could antimicrobial treatment be started a month before the operation. There were 10 postoperative deaths, all in females. The patients died within six weeks of operation—two of cardiac arrest, two of cerebral anoxia, three of shock, one of a vascular accident, one of a pulmonary embolism, and one of a transfusion reaction. There were six late deaths—two of respiratory insufficiency, and one of severe hemoptysis, and three due to unrelated causes. Complications after operation included vascular accidents in three, bronchial leaks in five, fistulas with empyema in six, empyema without fistula in three, reactivation in one, contralateral aspiration lobular collapses in five, psychoses in two, damage to the thoracic duct in one, and hemothorax in one. All the six fistulas with empyema and three of the five simple leaks developed in patients who were receiving effective antimicrobials prior to operation. Of the 59 survivors, 57 were followed up for six months to two and one-half years. Spread or reactivation occurred in two patients and two developed nontuberculous infection of the postresection thoracoplasty space; 70% of these were in a satisfactory state when last seen.

Hypertension.—H. R. Singh (*Current Medical Practice*, vol. 2, October, 1958) analyzed a series of 50 patients with hypertension. The maximum number of patients fell in the age group of 41 to 50 and the next in the age group 51 to 60. No patient was below the age of 15 years; 16% were female and 84% were male. This greater preponderance in men may be due partly to the greater hospital attendance of men as compared to women. Fourteen were vegetarians and 36 were used to a mixed diet. The vegetarians remained mostly on a rice diet. Fourteen were businessmen, 11 were farmers, 8 were teachers or students, 7 were housewives, 7 were laborers, 2 were secretaries, and 1 was a public servant. The various symptoms for which treatment was sought were giddiness, headache, palpitations, dyspnea, insomnia, nervousness, irritability, throbbing in the head, inability to concentrate, lassitude, anasarca, loss of appetite, distention of the abdomen, edema of feet, tinnitus, diminution of vision, precordial pain, hematuria, hemoptysis, hematemesis, epistaxis, and polyuria.

Giddiness was present in 6% of those with hypertensive heart disease and cerebral thrombosis and in 6% of those with hypertension with no enlargement of the heart. Of those with hypertensive heart disease and congestive failure, 8% had giddiness. Headache was common in those with uncomplicated hypertension. Palpitation was common in

those with hypertension associated with congestive heart failure. Dyspnea was present in 26% of this group and anasarca in 14%. The maximum systolic pressure recorded in this series was 290 mm. Hg (average 185) and the maximum diastolic pressure was 160 mm. Hg (average 114). Enlargement of the heart was found in 80% of these patients, the second aortic sound was accentuated in 60%, and systolic murmur was heard in the mitral area in over 42%. Ophthalmoscopic examination revealed the presence of hypertensive retinopathy in nine patients. The urine was normal in 28% and the rest showed various grades of albuminuria; 18% had casts in urine. Although clinically enlargement of the heart was seen in only 80% of the patients, a roentgenogram showed an enlarged left heart in 88%. An electrocardiogram was obtained in 14 patients. Of these 2 were normal, 1 showed left axis deviation, 10 had evidence of left ventricular strain, and 1 had left bundle-branch block. The average blood urea level was 30.14 mg. per 100 cc. In patients with hypertensive heart disease, hypertensive heart with congestive failure, and hypertensive heart with renal failure it went up to 44.4, 62, and 77.6 mg. per 100 cc. respectively. There were seven deaths in this series—three of congestive heart failure, one of uremia, one of cerebral thrombosis, one of severe anemia, and one of right apical tuberculosis. The rest responded well to therapy.

Effect of Splenectomy on Lymphopoiesis.—C. M. Rangam and co-workers (*Indian Journal of Medical Sciences*, vol. 12, October, 1958) studied the effect of splenectomy on circulating lymphocytes and the lymphoid tissue. Albino rats were divided into four groups. Total splenectomy was performed on two groups; in the third, only the omentum was mechanically handled after laparotomy; and the fourth group served as a control. In the first group the lymphoid tissue from the neck, thorax, axilla, and groin was collected at the height of leukocytosis after splenectomy and in the second group it was collected after the ninth week, when the peak of leukocytosis had passed. Total and differential counts were made in all animals before and at varying intervals after operation. An increase in the number of leukocytes was noticed six hours after splenectomy, reaching a maximum by the end of the first week, after which the number started declining but was still higher than normal after the ninth week. This leukocytosis was due to an increase in both granulocytes and monocytes. In the third group the leukocytes showed a slight rise four weeks after operation and returned to normal by the seventh week. This rise was insignificant as compared to the leukocytosis in splenectomized animals. There were negligible fluctuations in the number of leukocytes in the control group. The normal lymph node in a rat is only a collection of lymphocytes within a delicate capsule without any differentiation

into cortex and medulla. In splenectomized rats, a definite follicular pattern with prominent germ centers could be seen and indicated a state of hyperplasia. In the second group where the lymphoid tissue was examined after nine weeks, the histological findings had reverted to normal. Thus the number of circulating lymphocytes was found to be more than doubled after splenectomy. The spleen probably controls the number of circulating lymphocytes by its action on lymphoid tissue as suggested by the rise of lymphomononuclear cells and the hyperplasia of lymphoid tissue after splenectomy.

NEW ZEALAND

Experimental Lung Transplantation.—Dr. Borrie (*Proc. Univ. Otago M. School* 36:32, 1958) reported that, although previous experiments on excision and reimplantation of the left lung in sheep showed that immediately after operation there was a measurable oxygen uptake by the reimplanted lung, no animal survived more than six days. Death was most commonly due to pulmonary infarction. As this could have arisen in either the pulmonary artery or veins its origin, cause, and means of prevention were further investigated by studying separately the effects of division and resuture of each of these components. After induction of anesthesia and performance of differential bronchspirometry, thoracotomy was performed on the left. The left pulmonary artery was isolated, divided, and resutured. All eight animals survived operation. Preoperative measurements had established the function of both lungs, the right absorbing more oxygen than the left. Immediate and late postoperative bronchspirometry showed that the proportionate oxygen uptake of the left lung was unaltered by the operation. Autopsy confirmed patency of the left pulmonary artery and revealed a soundly healed anastomosis with no evidence of intravascular clotting or obstruction. It was concluded that division and resuture of the left pulmonary artery is feasible without interfering with the ability of the left lung to take up oxygen. These results further suggest that the problem of intravascular clotting after lung excision and reimplantation is not arterial.

Another problem investigated was the question of the ligation of the left bronchial artery (*Proc. Univ. Otago M. School* 36:31, 1958). Previous experiments had shown that in the course of lung transplantation involving division of all hilar structures, the left bronchial artery proved too small for resuture and was therefore ligated. Through the left intercostal thoracotomy the left main bronchus was isolated, the bronchial artery was ligated, and the wound was closed. Immediately after op-

eration differential bronchspirometry was repeated, and again two months later, after which the sheep was killed and the lungs examined microscopically. The experiment was performed on six animals, none of which died during operation. Preoperative spirometry had established the normal oxygen uptake of each lung. Immediately after operation, and with the animal still anesthetized, the total oxygen uptake was reduced, but the left lung:right lung oxygen absorption ratio remained unchanged. Two months after operation there was still the same proportionate oxygen uptake by the left lung, and the animals remained healthy and thriving. It was concluded that ligation of the bronchial artery has no measurable effect on the proportionate oxygen uptake either immediately or within two months of operation.

Renal Hypertension and Polyuria.—Dr. McQueen (*Proc. Univ. Otago M. School* 36:8, 1958) reported further studies on the occurrence of gross polydipsia and polyuria in rats with unilateral renal ischemia. This phenomenon is related to the development of gross vascular changes in the originally intact kidney, changes which apparently occur more frequently in animals given 0.5% saline solution to drink than in those given water. Of 168 rats drinking 0.5% saline solution and observed for four weeks, 27 (16.1%) developed polydipsia, i. e., fluid intakes more than three times those of the control period. Of 48 animals drinking water, only two (4.2%) developed polydipsia. Blood pressures were not significantly different in the two groups. The kidneys of 51 animals, 15 of which had shown polydipsia ranging from 91 to 348 ml. per day (mean 157), were examined. The originally intact kidneys of these 15 animals showed the changes characteristic of malignant hypertension. Glomerular necrosis was present in all, varying from patches of local necrosis or large areas of coagulation necrosis to hemorrhagic infarction of the glomerulus. In 13 of the 15 polydipsic animals, arteriolar necrosis was present, in most cases to a gross degree. Changes in the kidney originally rendered ischemic were also in general somewhat more severe in the polydipsic group than in the rest, but in several animals showing histological changes of malignant hypertension in the kidney not operated on, changes in the kidney operated on were mild. Contrariwise gross ischemia in the kidney operated on was often found in the absence of polydipsia or of severe vascular damage in the originally intact kidney. The degree of ischemia in the kidney operated on was not a factor influencing the production of the polydipsia syndrome which was, however, clearly correlated with the vascular changes in the originally intact kidney.

NORWAY

Penalty for Fictitious Prescriptions.—According to law prescriptions are as a rule drafted in the name of the person for whom the prescribed drug is intended. The inclusion of the words "as a rule" in the drafting of the above sentence indicated the possibility of exceptional circumstances. When, for example, a physician prescribed for a venereal disease patient he might use a fictitious name. This loophole was designed for the bona fide relationship of patient and physician and not for any conspiracy to subserve the cravings of a drug addict. Between autumn, 1955, and spring, 1957, a physician issued prescriptions for certain narcotics to a woman whom he knew had undergone a course of treatment for the relief of drug addiction. Several of the prescriptions he had given her were made out to a fictitious person. In his defense he quoted the above-mentioned loophole, adding that no penalty had been provided for such juggling with names on a medical prescription. This defense being rejected by a lower court, he appealed to a higher court, which rejected his appeal and imposed a sentence of 30 days.

Medical Impostors.—It might be supposed that in such a small country as Norway, with a population under 4 million, human relationships would be so transparent that there could be no opening for bogus physicians. Recent events have challenged this assumption, and steps are being taken to protect the public from such impostors. Druggists are enjoined to bring prescriptions by laymen posing as physicians to the notice of the authorities, and the persons responsible for editing telephone directories are directed to scrutinize the credentials of newcomers who claim the title of physician. The owners of buildings used as offices by physicians must subject would-be tenants thereof to the same scrutiny to make sure of their medical qualifications. The head of the Public Health Service warned hospital administrators to make sure that all the medical members on their staffs are bona fide physicians. He issues a yearly list of the duly qualified physicians, dentists, and veterinarians which serves as a guide for pharmacists. County health officers also keep a list of the duly qualified physicians in their counties.

Neurasthenia.—Prof. O. J. Broch (*Tidsskrift for den norske lægeforening*, Nov. 15, 1958) made a statistical analysis of a series of 94 patients with neurasthenia. There was a 1:6 ratio of men to women, and the age group 40 to 70 was most heavily involved. The divorce rate in this series was higher than that of the general population. In about 47 the duration of the syndrome was five years or more. While the pain was usually precordial, there were several patients in whom it was referred to the abdomen.

However dramatic the descriptions of it, the pain was rarely violent, and it was often associated with a cutaneous tenderness demonstrable by pinching a fold of the skin, preferably with the help of an algometer that measured the pressure required to elicit pain. About 46 patients volunteered the information that the pain was associated with a feeling of anxiety, and there were several admissions to hospital with a tentative diagnosis of myocardial infarction. Of the 19 operations which had been performed on these patients, 7 were on the internal reproductive organs and 5 on the appendix. Psychotherapy rather than digitalis, nitroglycerine, or bishydroxycoumarin is indicated, and the physician should avoid terms calculated to give a false impression of heart disease. The judgment and attitude of physicians probably have more influence on the prognosis than in any other psychogenic disease.

Tetanus.—Two original articles and an editorial on tetanus in *Tidsskrift for den norske lægeforening* (Dec. 1, 1958) stressed the fact that, although tetanus is a preventable disease, it continues to take a yearly toll of about 10 deaths in Norway. Dr. R. Jorde reviewed a series of 78 patients treated at the Bergen City Hospital between 1913 and 1957, with 24 deaths. Most of the infecting injuries had been so slight that a physician had not been consulted for them. With one exception, comparatively large doses of antitetanic serum were given, supplemented by sedatives and wound revision as required. In the second article, Dr. P. Kolstad, writing from the Vestfold Central Hospital, pleaded for more team work, preferably on the surgical service of the hospitals. Formerly it was customary to admit the patient to the medical service where he was given antitetanic serum. Now he is likely to fare better if he comes to a surgical unit whose staff includes a specialist in anesthesia. Here, in the acute ward, the patient can be given the benefits of team work. The editorial urged active immunization in childhood in conjunction with diphtheria and whooping cough immunization.

Chloroquine for Arthritis.—Drs. Stuart and Aukland (*Nordisk medicin*, Dec. 4, 1958) gave Resocin (chloroquine phosphate and diphosphate and Nivaquine) to 58 patients who had chronic rheumatoid arthritis. The dosage was 1 tablet (0.25 Gm.) three times a day for four to seven days, then 1 tablet twice a day for about two weeks, then 1 tablet once a day for about a month, and then a maintenance dose of 2 to 4 tablets a week. After the withdrawal of 13 cases as irrelevant to an estimate of the action of this drug, there remained 45 patients (8 men and 37 women) whose ages ranged from 29 to 80 years and who represented all the stages and forms of the disease. It had lasted from 5 weeks to 40 years

(average about 10½ years). These patients were classified in four groups according to the severity of the disease, with the bedridden (6) at one end and the comparatively well (3) at the other. Clinical findings were correlated with the sedimentation rate whose frequent concordance emphasized the reliability of both. The duration of the disease had apparently not affected the outcome, and the patients to benefit from this treatment were often those who began to react well to it after it had been given for three or four days. Of the eight who abandoned it on account of side-effects, seven complained of nausea. A rash, usually on the face, developed in seven. These and other side-effects invariably passed off quickly after the drug was withdrawn or its dosage was reduced, and no serious side-effects were referable to bone marrow or liver. Thirty-three patients showed subjective and 21 objective improvement. Several became worse when the dosage was reduced, only to improve when it was increased. The authors concluded that chloroquine may be tried in chronic rheumatoid arthritis on a level with other anti-rheumatic agents.

SWEDEN

Oral Treatment of Diabetes.—In the past six months 35 diabetics were treated with chlorpropamide (Diabinese), on whose action Dr. B. Andersson reported in *Svenska läkartidningen* for Nov. 7. At first 2 tablets were given daily after breakfast. Later this dosage was halved, and then only half a tablet was given with the possibility in mind of an even greater reduction. It was on the 2-tablet dosage that the only case of damage (apparently transient) to the liver was observed. With this complication in mind, Andersson does not yet recommend chlorpropamide for general use nor without close supervision. The initial dose should not exceed 500 mg. (1 tablet), and the maintenance dose should be 100 to 250 mg. Dietetic precautions should never be relaxed.

Tuberculosis and Sarcoidosis Rates.—In Sweden the periodic medical examinations for the fighting services cover the same ages and geographical areas from year to year and so can throw light on the comparative frequency of tuberculosis at different periods. Dr. S. Wallgren (*Nordisk medicin*, vol. 60, 1958) prepared a table showing the number of cases of active pulmonary tuberculosis and of pulmonary sarcoidosis discovered in these services from 1950 to 1957. In 1950 there were 1.12 cases of active tuberculosis per 1,000 persons examined, whereas in 1957 this figure was down to 0.48. Between the same years the findings of pulmonary sarcoidosis were remarkably uniform, with 0.33 per 1,000 in 1950 and 0.39 in 1957. The dissimilarity of the steeply falling tuberculosis rate and the almost flat

sarcoidosis rate is of interest alike to the believers and disbelievers in an etiological identity of the two. The change in their relative frequency is emphasized by the facts that in 1950 the ratio of pulmonary sarcoidosis to pulmonary tuberculosis cases was 30:100, whereas in 1957 it was 81:100. Wallgren found a similar state of affairs in the community as a whole. His military surveys confirmed observations made in the United States that a correlation can be established between the prevalence of coniferous forests and pulmonary sarcoidosis, and he noted that, except for a few parks, every Swedish forest contains a mixture of pines.

Diabetes and Pulmonary Tuberculosis.—During the period 1953-1954 a census of the diabetics in Kristianstad County showed that they numbered 1,326 or 5.1 per 1,000 population, the figures being 4.6 and 5.7 for males and females respectively. This rate rose with the patients' age, being only 2.2 per 1,000 in the age group 20 to 29 years, whereas it was 19.3 in the age group 70 to 79. All but 56 of the 1,326 diabetics underwent an x-ray examination of the lungs, and among the 1,270 thus examined, the pulmonary tuberculosis rate was 3.6%. The corresponding rate for the population as a whole was only 0.88%. Classification of the diabetics in 10-year age groups showed that their tuberculosis rates were from two to five times higher than for non-diabetics. The tuberculosis rate for diabetics under 50 was 5.9%, whereas for diabetics over this age it was only 2.7%. This age difference was still more marked (3.6 and 1% respectively) when only those requiring treatment for their tuberculosis were considered. The more severe the diabetes, the higher the tuberculosis rate. It rose with the duration of the diabetes, being only 2.4% for the patients whose diabetes had lasted under 5 years, whereas it was 5.9% for those whose diabetes had lasted 10 years or longer. In 43 of 46 patients with pulmonary tuberculosis this disease was diagnosed for the first time in patients known to be diabetics, and this supports the concept that it is the diabetic who develops tuberculosis, not the tuberculous patient who becomes a diabetic. Silver and Oscarsson, (supplement to *Acta medica scandinavica*) maintained that, contrary to earlier beliefs, the prognosis for the tuberculosis of a diabetic need not be worse than that for a nondiabetic.

Mastoiditis Rediviva.—Dr. G. Ewert (*Svenska läkartidningen*, Nov. 28, 1958) stated that in a series of more than 2,200 patients with acute otitis media seen between 1950 and 1954 it was necessary to perform a mastoidectomy in only 1%. In the three-year period 1955-1957 this rate rose to about 2%. The author believed that the patients now requiring mastoidectomy may represent different types of

disease, from the classic acute mastoiditis to the long drawn out case proving refractory to treatment and characterized by a marked tendency to form granulation tissue. Many such cases suggest that the sulfonamide or antibiotic given has not reached the foci of disease in a concentration high enough to be effective. Here the practice of giving these drugs by mouth under the occasionally absent-minded supervision of a layman may be to blame. If hearing or the normal appearance of the tympanum does not return in three to four weeks, or if a couple of relapses occur at short intervals, the patient should be hospitalized or at any rate seen by a specialist.

UNITED KINGDOM

Control of Status Epilepticus.—Taverner and Bain described a rigorously designed double-blind trial that demonstrated the efficiency of lidocaine hydrochloride as an anticonvulsant for the control of status epilepticus and serial epilepsy (*Lancet* 2:1145, 1958). The principle adopted was to introduce either a 1 or 2% solution of lidocaine or a saline solution control into an intravenous saline solution drip immediately after a seizure and to measure the subsequent seizure-free interval. Twelve such injections constituted a test. The dose of lidocaine given in any one injection was 200 or 400 mg. administered at a rate of not more than 100 mg. per minute. The results showed that lidocaine has an anticonvulsant action and produces a significant lengthening of the interval between seizures. The effect was of the graded variety, linearly related to the logarithm of the dose. The authors believed that with suitable modifications the method could be used not only to evaluate different anticonvulsants in status epilepticus but also to assess the effects of drugs in other illnesses where signs or symptoms recur at intervals. McWilliam controlled continuous convulsions in children by the intravenous injection of a solution of diphenylhydantoin sodium in doses ranging from 25 to 500 mg. (*Lancet* 2:1147, 1958). The drug was usually effective within 10 minutes of injection, although in the more refractory cases a second injection was necessary. Diphenylhydantoin given intravenously was superior to paraldehyde in terminating epileptic convulsions. No side-effects were observed.

Remittent Insulin in Insensitive Diabetes.—Wells described a diabetic syndrome seen in Singapore, characterized by marked insulin insensitivity with periods of complete or partial remission (*Brit. M. J.* 2:1328, 1958). A number of diabetics in this area showed extreme fluctuations in their insulin requirements. Some of them needed 200 units of insulin daily for the control of glycosuria, yet in periods of remission they remained fit and well, with no

glycosuria, without insulin or any other treatment for their diabetes. This was in contrast to diabetics in Europe and North America who rarely needed more than 100 units daily. According to the author many of these insulin-insensitive diabetics in Singapore could be well controlled with such hypoglycemic drugs as tolbutamide.

Tests with Live Vaccines.—The possible advantages of live vaccines, as Prof. G. W. A. Dick and co-workers (*Brit. M. J.* Nov. 15, 1958) point out, are that they can be given by mouth, are cheaper to produce, and may give better protection. No illness definitely attributable to the use of attenuated poliovirus vaccines has so far been reported among thousands of persons who were observed carefully after vaccination in different trials with several different attenuated virus vaccines. This was encouraging; but nearly all natural poliomyelitis infections were mild or inapparent, and many of the people in the trial series were either immune before vaccination or their selection had not been ideally made. Unfortunately, the vaccine viruses undergoing trial had been shown to spread from vaccinated people to their associates. Some viruses regained virulence and paralyzed monkeys in which they were tested. For this reason it is unlikely that any country financially able to undertake a program with inactivated vaccines should use a live vaccine until it has been shown to be safe and to produce good protection. Attenuated vaccines might be used to supplement inactivated vaccines in the hope of eliminating wild viruses from the community, but not enough is known to explore this possibility. The use of attenuated vaccines to control epidemics would involve the employment of a virus the safety and effectiveness of which had not been adequately studied. There remains the possibility of using attenuated vaccines in countries that cannot afford inactivated virus vaccination programs, but this should be preceded by carefully controlled trials to define the limits of safety of the live vaccines.

Suicide.—A recent survey in North London showed that married people, particularly those with children, are less prone to suicide than the unmarried. Men showed a higher suicide rate than women, and the liability to suicide increased with age in both sexes. The findings were given in the *Medical World* by Mr. Gavin Thurston who said the family physician could play a part in detecting the potential suicide. A high divorce rate was accompanied by a high suicide rate. Poverty was not correlated with suicide; on the contrary, the rate rose in the higher income groups. In England and Wales the rate remained at about 11 per 100,000 yearly. Denmark, with 23 per 100,000, showed the highest rate and Portugal, with 2 per 100,000, the lowest. Lone-

liness was a frequent causative factor. The decline of the suicide rate in time of war, when a nation is welded into a whole for the purpose of defeating an enemy, is significant. Suicides as seen by the coroner fell into three groups, the depressives, the emotionally unstable, and the social failures. Depression was the basis of 75% of all suicides. It accounted for most cases of murder and suicide of a husband and wife. Here may lie some chance for preventive work. Any decline in the suicide rate is likely to be found in this group. Caution by physicians in the use of barbiturates would undoubtedly reduce the rate. The depressive patient should never be given charge of his own barbiturates. They should be entrusted to a relative. Unless there is agitation, it seems illogical that a person suffering from this kind of illness should be depressed further by sedation.

Medical Television.—Closed-circuit television showings of surgical operations and clinical demonstrations at the scientific meetings of the British Medical Association will in future be private and confidential. The press will not be invited to attend, and reporters have been asked not to cover the programs. The association's council laid down this policy to avoid the risk of embarrassment to the patients and hospitals concerned. The purpose of the demonstrations is the postgraduate education of the physicians attending the meetings. They are an extension of the confidential tuition which a medical student receives at the patient's bedside in hospital during his undergraduate training.

Incidence of Poliomyelitis.—Provisional estimates of the number of cases of poliomyelitis contracted in the first 45 weeks of 1958 showed a substantial fall. The number is the lowest since 1948. Figures for the first 45 weeks of recent years were: 3,354 in 1956; 5,017 in 1957; and 2,015 in 1958. Of the 2,015 cases reported, 1,358 were paralytic. This is about the usual proportion. Salk vaccine was used freely side by side with the English vaccine, and supplies are plentiful.

Ventricular Septal Defect.—In an article in the *British Medical Journal* of Dec. 6, a team of 12 workers from the Postgraduate Medical School of London reported on 21 patients with ventricular septal defects who were treated by open surgery with use of extracorporeal circulation. Of the 15 patients with ventricular defects as the sole lesions only 1 died. Of the four with an additional patent ductus arteriosus, two died. Another patient with a double defect also died, but one with a single ventricle survived. As mentioned, one of the deaths occurred at operation when it was found impossible to ligate a large ductus arteriosus. The other three deaths occurred between 5 and 36 hours after operation,

and were similar in that sudden cessation of respiration followed a period of restlessness and low blood pressure. None of these patients had more than a slight fall in pulmonary arterial pressure after closure of the defect, and death might have been due to abrupt right ventricular failure. Two of these three had a moderate or large hemothorax. One was treated by open operation. At discharge from hospital three to six weeks after operation all these patients were active and well. The exercise tolerance was improved in most patients.

These results agree with those of other workers in showing that closure of ventricular septal defects can be carried out, in special centers, as a routine surgical procedure with an acceptably low mortality, in certain cases. The indications and contraindications for operation have been outlined, but in assessing patients for operation it is necessary to detect additional lesions, and to determine whether a good hemodynamic response will result from closure. The most important additional defect is a patent ductus arteriosus, for it renders perfusion impossible. This lesion was definitely diagnosed (by aortography) in only one of the four patients who had it, though it was considered in one other. The diagnostic difficulty may lie in the fact that in patients with a ventricular septal defect the duct is virtually functionless and therefore gives few direct signs. Support for this hypothesis was given by the absence of a thrill over the ductus at operation in three of the four patients, and by the findings in another patient in whom prior to aortography 2 ml. of indicator dye was injected into the aorta through a retrograde arterial catheter and no recirculation due to dye entering the pulmonary artery was found. At operation no change in right heart or systemic pressure was noted when the duct was ligated. One patient was found at operation to have severe aortic incompetence although clinically this was not diagnosed with certainty.

Another problem is that of predicting which patients will achieve a substantial fall in pulmonary arterial pressure after closure. In this respect other workers have emphasized the importance of the actual level of pulmonary arterial pressure, but in the present series this was not helpful. The pressure should be considered in relation to pulmonary flow and the pulmonary arteriolar resistance should be calculated. The difficulty in young children of measuring oxygen consumption, among other factors, makes the calculated resistance in many cases at best an approximation. It may turn out to be just as helpful to consider simply the oxygen saturation in the pulmonary artery, which was over 80% in all the patients in this series whose pulmonary pressure fell after closure. It is necessary to consider all aspects in deciding for or against operation in borderline cases of patients with a high pulmonary resistance. No patient should be categorically denied operation if there is evidence of an appreciable

left-to-right shunt, but when the pulmonary resistance is high and the unfavorable features already mentioned are present a much higher operative mortality must be faced. It is clear from these results, however, that a number of patients who might in other centers be considered inoperable have had their defects successfully closed.

Health Survey in General Practice.—A survey was made of the morbidity seen in general practice (*Morbidity Statistics from General Practice*, vol. 1, 1958, Her Majesty's Stationery Office), based on the consultation between physician and patient and the diagnosis of the patient's complaint. Nearly 400,000 patients were seen over a period of a year by 171 physicians in more than 100 practices. The number of consultations reached nearly 1,500,000. Two rates were determined: the "consultation rate," which measures the number of times a patient was seen by the doctors for a particular disease; and the "patient-consulting rate," which is the number of patients suffering from a disease regardless of the number of consultations. The latter gave a truer picture of the amount of sickness in the community, because physicians differ widely in the number of consultations which they give to a patient for a particular illness. The survey showed that 30% of female and 37% of male patients on National Health Service lists did not consult their doctors during the year under review. More patients under the age of 15 years than over this age were seen but the elderly patient tended to be seen twice as often as the average child or young adult.

The number consulting their doctors for malignant disease was 5.2 per 1,000, corresponding to a total number of 230,000 patients with cancer under treatment throughout the country. The patient-consulting rate for psychoneurotic disorders was 45.7 per 1,000, which corresponds to a total of 2 million patients under treatment, or 5% of the population. For the common cold, the condition for which advice was most frequently sought, the patient-consulting rate was 81 per 1,000. This required fewer consultations than bronchitis, which required the most attention. This condition had a consultation rate of 261 per 1,000 and a patient-consulting rate of 65 per 1,000. Influenza came fifth on the list because in 1958 there was no serious epidemic.

Risks of Medical Treatment.—Medical treatment has its risks for the patient, the community, and the doctor according to Dr. Richard Asher in an address at the British Medical Association's three-day scientific meeting in Southampton. In these treatment-conscious days we get the idea that for every illness there is a treatment. We are losing sight of the fact that there are some minor ailments that we may have to endure. Linked with this feeling, pointed out Mr. Ellison Nash, a London surgeon, is

the growing tendency for doctors to be sued by patients who failed to respond to treatment. More and more people tell their doctors they have heard about some new treatment and want to try it. It might be anything from radioactive cobalt to hypnosis. Surgeons are particularly exposed to the risk of litigation by dissatisfied patients. Although it is wrong to scare the parents of a child about to undergo a major operation, the surgeon must protect himself and make the parents aware that some risk is involved. In the treatment of older people especially, one of the risks of treatment must include the risks associated with staying in bed. Dr. Asher stated that he would prefer to be completely honest with patients, but frankness often produces nothing but unhappiness. It always helps to leave people with a ray of hope. It is a pity that some deserving charity cannot dispense the useless pills and collect the money which now goes to quacks.

Epidemic of Streptococcic Nephritis.—The potentially epidemic nature of nephritis is still not generally recognized. Dr. T. George and co-workers described finding four cases of acute nephritis among 24 boys in a residential school who had suffered from acute pharyngitis 10 to 19 days previously (*Brit. M. J.* 2:1381, 1958). Two months later seven of the boys still harbored *Streptococcus pyogenes* type 12, and red blood cells were found in the urine of five not previously considered to have renal involvement. Examination of children in neighboring schools showed that some of them harbored type 12 or related strains of *Str. pyogenes*, and red blood cells and casts were found in some of the urine specimens. A year later further cases of nephritis were brought to light in the area. Letters were then sent to all the physicians in the county. This resulted in the discovery of another 48 patients, mainly school children, many of them infected with type 12 streptococci. Another epidemic of nephritis was described by Drs. M. Pleydell and W. Turner-Hall. This was first observed in the children of a village school, and when all the physicians in the county were contacted 89 cases of nephritis occurring over a three-year period were brought to light. Type 12 streptococci were recovered from many of the patients. No association was noted between the distribution of nephritis and scarlet fever cases during the period under review. It was suggested that energetic measures be taken to prevent the spread of streptococcic infection, once an epidemic of nephritis has occurred, by excluding children who might be carriers from school and by prophylaxis with phenoxymethyl penicillin.

Deafness Following Maternal Rubella.—A national prospective inquiry into the effects of virus infections during pregnancy was made by the Ministry of Health. Jackson and Fisch have made a sub-

sidary investigation on some of the children from this inquiry whose mothers had rubella during the first 16 weeks of pregnancy (*Lancet* 2:1241, 1958). The purpose of this investigation was to confirm or enlarge on the findings of the national inquiry by more detailed clinical examinations and extensive hearing tests in a selected group of children who survived to the age of 4 years. Fifty-seven children whose mothers had rubella during the first 16 weeks of pregnancy were examined and compared with 57 whose mothers had no infection during pregnancy. They were matched for age, sex, country of birth, maternal age, and parity. Hearing was tested for a wide variety of sounds, covering as many frequencies as possible. Voice tests were made, and hearing for spoken words and for speech sounds such as single consonants was tested. Pure tone threshold audiometry was performed in a sound-proof room, each ear being tested at octave frequencies from 128 to 8,192 cycles per second.

The investigation revealed a general incidence of congenital deafness of 30.4% in the children of mothers who had rubella in the first 16 weeks of pregnancy. Deafness was unilateral in 36% of the children affected. The authors pointed out that, owing to the difficulty of calculating the exact commencement and duration of pregnancy, it would be wrong to conclude that deafness cannot result from rubella occurring outside the period under consideration. Deafness was previously undetected in 62% of the children. This indicates the importance of detailed hearing tests including audiometry in the diagnosis of rubella-induced deafness in young children. Any child whose mother gives a history of rubella in early pregnancy, even if hearing appears to be normal, should be followed up until such time as audiometry can be performed to exclude the possibility of deafness.

Dental Health of Schoolchildren.—Dr. May Mellanby and co-workers conducted a 20-year survey of the deciduous teeth of 5-year-old schoolchildren. Inspections at the same or similar schools were made every two years since 1943. As a result of their study, based on the dental condition of 1,241 children (*Brit. M. J.* 2:1441, 1958), they concluded that the incidence and extent of dental caries declined from 1943 to 1947 but rose again until 1955, since when there has been little change. The percentage of carious teeth shown in the present survey was 31.5 for both jaws. The highest incidence of caries was in the first and second molars of the lower jaw (62 and 72%) and the lowest in the canines of the lower jaw (7.8%). The proportion of carious teeth filled has increased from about 2.5 to 11.0% in the last 14 years. Although the percentage of teeth extracted varied to some extent from year to year, it was greater in 1955 and 1957 than at any previous dental inspection. This may represent improved dental care rather than any deterioration. Children

with black or dark brown stains had a smaller percentage of carious teeth than the children with no stain or green stains. The reduction in dental caries over the last 20 years was largely due to the more scientific nutrition of pregnant women and infants during the war and postwar rationing periods, when among other things the amount of calcium in the diet was increased. The subsequent freer choice of diet when cheaper foods, including cereals, were more easily obtainable, together with the reduction in the consumption of milk and cod liver oil, could account for some of the deterioration that occurred between 1947 and 1955. Another possible cause of the increase in dental caries in recent years is the large consumption of iced fruit confections and drinks by young children.

Staphylococcic Resistance to Antibiotics.—By 1957 about 50% of all staphylococcic infection occurring in many hospitals was found to be resistant to penicillin, streptomycin, and tetracycline, so that erythromycin and novobiocin had to be used more extensively. It is, however, well known that staphylococci develop resistance to the two latter antibiotics more readily than to any other except streptomycin. Dr. Mary Barber and co-workers described a policy formulated by a hospital cross infection committee for the control of antibiotics in a large London hospital (*Brit. M. J.* 2:1377, 1958). The essential part of the policy was the abandonment of penicillin except in certain wards of the hospital and the use of two antibiotics in combination whenever possible, and always when one was erythromycin or novobiocin. All staphylococcic infections in the wards of the hospital were studied bacteriologically for a year, six months before the new policy was introduced and six months afterwards. The strains of *Staph. pyogenes* isolated were tested for sensitivity to penicillin, streptomycin, tetracycline, chloramphenicol, erythromycin, and novobiocin. Analysis of erythromycin-resistant and chloramphenicol-resistant infection showed evidence of cross resistance between these two antibiotics. Of 23 erythromycin-resistant strains, 11 came from patients who had been treated with chloramphenicol. Eight of the erythromycin-resistant strains also showed resistance to chloramphenicol. No such cross resistance was noted between erythromycin and novobiocin. Of 108 patients treated with this combination none showed a staphylococcus resistance to erythromycin.

This investigation emphasizes the danger of erythromycin-resistant infection becoming a hospital problem if the unrestricted use of erythromycin is permitted. Since there is cross resistance between this drug and chloramphenicol, combined treatment with these two antibiotics offers no solution. Com-

bined treatment with erythromycin and novobiocin seems more promising. If given together these two antibiotics delay the emergence of erythromycin-resistant staphylococci. No erythromycin-resistant staphylococci were isolated from the 108 patients treated with the combination. It is too soon, however, to say whether this will do more than postpone the evil day.

Vital Statistics.—In his annual review for 1957 the Registrar General states that the infant mortality, 23.7 per 1,000 live births, is one of the lowest in the world. In Europe only the Netherlands and Sweden have lower rates. In five years infant mortality has fallen by 20%. Some 70% of the deaths occur within the first month of life, and mortality from all causes is greater in boy babies than in girls. The birth rate has increased by 0.6 to 15.6 per 1,000 population, and is now the highest since 1950. Divorce has declined slightly (by 541 cases a year).

The death rate from tuberculosis is still falling. It is now 5,375 annually, representing a decline of 17% for men and 20% for women, but this drop in the death rate is only in the age group from 16 to 64. Above that age there has been little change. The incidence of new cases (88 per 100,000 population for men and 55 for women) is the lowest yet recorded. Mass miniature radiography picked up two cases of tuberculosis for every 1,000 persons examined.

There were 18,186 deaths from cancer of the lung, an increase of about 5% over the deaths in 1956. Deaths from leukemia, particularly myeloid leukemia, have increased. There were 57 per million for men and 47 for women. Deaths from accidents and violence have increased. There were 21,870 deaths from this cause, an increase from 568 to 604 per 1,000,000 men in four years; the corresponding increase for women was from 298 to 383. Nearly 5% of all male deaths and 3.5% of all female deaths were due to violence, including car accidents, falls, and suicide. Deaths from car accidents rose by about 16%. Burns and scalds caused the deaths of 215 men and 492 women. The high incidence in the latter was due to their more inflammable clothing catching fire from exposure to open fires, electric and gas fires, and stoves.

There was a further increase in the number of deaths from coronary heart disease in both sexes. The figure was 47,809 for men and 28,515 for women. This represents an increase of 2% over the previous year for both sexes. In 10 years the death rate from this cause has doubled; nearly 15% of all deaths are due to it. In 1957, the death rate was 11.5 per 1,000 population compared with 11.7 for 1956.

CORRESPONDENCE

HISTOPLASMOSIS

To the Editor:—In the Dec. 27, 1958, issue of THE JOURNAL, page 2272, the editorial concerning histoplasmosis was both gratifying and disappointing. This is a disease known for 53 years, the knowledge of which has been accumulated in great part during the last 15 years. It is only recently that the significance of this illness has become evident and generally understood. This disappointing part of the editorial had to do with inaccuracies which tended to give false impressions, if not actually false information, concerning the disease. The first of these had to do with the finding of the organism in soil contaminated with feces of chickens, bats, and pigeons. The inference gained from the editorial is that the organism has been found in bird feces and in this way contaminates the soil. So far there has been no laboratory proof of this. Extensive cultural studies of the feces of chickens have not revealed *Histoplasma capsulatum*. The way in which soil becomes contaminated with *H. capsulatum* is not understood, and the reason or reasons that there is a higher concentration of the fungus in soil that has been contaminated with bird feces, especially in the neighborhood of chicken houses, are unknown.

Histoplasmosis has not been found as a clinical disease in pigeons, bats, or chickens. In fact, attempts have been made to infect chickens and pigeons with intravenously given injections of *H. capsulatum*. The results of these studies have shown that the organisms may be recovered from the animals 5 to 10 days after infection by intravenous route, but there is no evidence of active disease. Amphotericin B was stated to be of questionable value in the treatment of histoplasmosis. Difficulty in evaluating this drug in clinical material is implicit in the nature of the disease because it is so frequently a benign self-limited infection. In two clinical types, however, its effectiveness has been shown, and these are the pulmonary cavitory and the acute disseminated forms of histoplasmosis. In addition to this, convincing evidence of the drug's effectiveness has been presented by several workers in experimentally infected animals.

As correctly stated in the editorial, chronic pulmonary histoplasmosis is of particular significance since it so often mimics tuberculosis and may be treated as tuberculosis unless careful diagnostic studies are made. One pressing problem which was not touched on in the editorial was the significance of the disease in persons who have recently immigrated into the endemic area after previous residence in nonendemic areas. Another significant ob-

servation has been the large number of coin lesions of the lung, suggesting carcinoma, which have proved to be lesions resulting from histoplasmosis.

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ANTIFOAMING TREATMENT OF PULMONARY EDEMA

To the Editor:—From 1950 to 1954, studies were made at the Chicago Medical School and at Mount Sinai and Cook County Hospitals (Luisada, *Circulation* 2:872-879 [Dec.] 1950; Luisada and others, *ibid.* 5:363-369 [March] 1952; Luisada, and Cardi, *Circulation Res.* 3:510-513 [Sept.] 1955; and Weyl, *Illinois M. J.* 108:265-269 [Nov.] 1955), dealing with antifoaming or defoaming treatment of acute pulmonary edema. A method of treatment was described, based on the use of ethyl alcohol-oxygen vapor inhalation through either an oxygen mask or a nasal tube. The experiments were first conducted in animals with experimental pulmonary edema, then in patients with this clinical condition. The results were excellent, so that later this treatment alone was used in several cases and there was no need to use any other conventional therapy. After publication of these results, antifoaming treatment with silicon aerosol or with aerosols of heavy alcohols were described in New York. Further experiments were made in patients by Dr. Max Sadove of the University of Illinois, who used ethyl alcohol by aerosol in clinical cases, obtaining good results.

The concentrations used for ethyl alcohol were: 80 to 95% by nasal catheter, 30 to 40% by mask, and 20% by aerosol. Numerous hospitals and practitioners throughout the country have used this method of treatment. I have received communications from physicians reporting good results. Other physicians may have obtained less favorable results. It is unfortunate that others have not devoted time and energy to publication of their experience. This would have extended the general experience and either confirmed or contradicted our results. A general consensus about the practical utility of the defoaming therapy with ethyl alcohol vapors would be of interest to the medical profession. Emergency treatment of pulmonary edema is often undertaken by lay people (policemen, firemen, and nurses) who could be trained in the use of this method of treatment. I hope that physicians who have used the alcohol treatment will write

me in regard to their experience. Any comment will be appreciated, whether or not a detailed protocol of the cases was kept.

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AMERICAN SOCIETY OF CLINICAL HYPNOSIS

To the Editor:—The American Society of Clinical Hypnosis, the national society for the advancement of scientific hypnosis with more than 30 state and regional component sections and its membership restricted to physicians, dentists, and psychologists having a doctoral degree, neither sponsors nor approves any boards of certification in hypnosis organized by private individuals, such as that mentioned in *Medical News* in the Jan. 3, 1959, issue of *THE JOURNAL*, page 54. Nor does the American Society of Clinical Hypnosis consider at this time such proposed certification as either warranted or even legitimate, since hypnosis is a methodology and not a specialty. Also, the American Society of Clinical Hypnosis is in full accord with, and wishes to abide completely by the regulations established by, the Council on Medical Education and Hospitals of the American Medical Association and with the comparable recommendation of the Reference Committee on Dental Education of the American Dental Association. The entire problem of established certification boards is properly a function of duly constituted medical, dental, and psychological associations and not a matter of private and individual venture. The American Society of Clinical Hypnosis wishes to apprise its members and other interested persons that it knows of no duly constituted specialty board of medical hypnosis, either qualified to grant certification or approved by proper medical, dental, or psychological association.

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ARTERIAL THROMBOSIS AFTER DRUG THERAPY

To the Editor:—In the article entitled "Arterial Thrombosis with Gangrene After Use of Promazine (Sparine) Hydrochloride" by Opinsky, Serbin, and Rosenfeld (*J. A. M. A.* 168:1224-1225 [Nov. 1] 1958) the authors concluded that intravenous injection or perivascular infiltration of a moderately irritating drug such as promazine can lead to arterial spasm and thrombosis and so produce gangrene of the hand and fingers as in the two cases reported. They suggest the avoidance of the intra-

venous route for the administration of promazine for this reason. Since the proved and potential value of intravenously given promazine is great, it is especially important to evaluate this report. My contention is that both cases of gangrene were due to injection of the drug directly into an artery. The following facts support this conclusion.

Inadvertent arterial injection, especially in the region of the antecubital fossa, has been reported during administration of pentothal-sodium. Forrest and Saunders (*Brit. J. Anaesth.* 27:594-596 [Dec.] 1955) reviewed this subject and found 24 recorded cases, in 9 of which the patient had developed gangrene. Of these patients, six required amputation of the forearm, and the remaining three lost one or more digits. Most of these patients complained of pain in the hand immediately after the injection as they did in both cases reported in *THE JOURNAL*. Inadvertent arterial injection and the resulting complications can best be prevented (1) by being aware of the possibility, (2) by not tightening the tourniquet above arterial blood pressure, (3) by injecting slowly, so that the patient can report pain in the fingers before the completion of the injection, and (4) by using more dilute solutions of irritating drugs.

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To the Editor:—In the Nov. 1, 1958, issue of *THE JOURNAL*, pages 1224-1225, there is a clinical note entitled, "Arterial Thrombosis with Gangrene After Use of Promazine (Sparine) Hydrochloride," by Opinsky and others, in which I believe an inaccurate conclusion was drawn. It would seem that the cases represent examples of intra-arterial rather than intravenous injection. The same sequence of events will occur after any highly acid or alkaline compound has been injected intra-arterially. The anesthesiologist is well aware of this fact. Also, it is easy, and sometimes fantastically so, to enter the brachial artery or its branches when the antecubital space is used to give an intravenous injection. Several cases of gangrene occurring after the intra-arterial injection of pentothal sodium have been reported. An article in the *British Journal of Anaesthesia* (Baillie, 30:373-374 [Aug.] 1958) discusses this problem. I, therefore, disagree with the last statement in author's summary: "It is suggested that promazine be used intravenously with caution or perhaps not at all via this route." It would be more appropriate to state that the injection of any solution into a vein in the antecubital space should be done with caution for fear of entering an artery in this region.

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THE LEISURE CORNER

THE ART OF FENCING

The art of fencing, or the art of attack and defense with foil, *épée*, saber, and similar weapons, has been practiced by man since the dawn of recorded history. Swords were in use by the Bronze Age. Ancient peoples such as the Persians, Babylonians, Greeks, and Romans paid considerable attention to swordsmanship. At the beginning of the fifteenth century, however, the general use of gunpowder superseded swordfighting and fencing was brought into popularity as an art. There was a sudden transformation in weapons to lighter and more manageable forms, and guilds of fencing masters sprang up all over Europe to study and teach the use of the sword. When dueling became a common way of settling quarrels, fencing became a necessary part of a gentleman's training.

The Italians are credited with being the first to concentrate on the skillful use of the point of a sword rather than the edge. The lighter weapons and the nimbler, more controlled play which they evolved spread rapidly throughout Europe, and by the sixteenth century rapier fencing was formalized. The rapier, with a sharp point and cutting edges, displaced the heavy, cumbersome, double-edged sword. The *épée*, in turn, was a further refinement, while the foil, a light flexible thrusting weapon with a blunted point, was introduced as a practice weapon. And from the foil and its use, fencing developed from a means of combat to an organized sport.

During the seventeenth century a change in dress revolutionized swordsmanship. The courtiers of Louis XIV of France adopted the fashion of wearing silks and satins—panniered dresses, brocaded coats, and knee breeches with silk stockings and high heeled shoes. The long, trailing rapier, suitable for an earlier age, was now replaced by a light, short, court sword. With this light weapon it was possible to make attacking and defensive movements with a single weapon that could be wielded with only one hand. Actually, this was the first time swift and subtle swordplay was able to come into its own.

The speed and dexterity with which light swords were used at close quarters involved the risk of seriously injuring the eyes, for at this time the fencing mask was unknown. It therefore became necessary to introduce a number of basic rules to minimize the danger. For example, the only valid hits were those made on the chest, for the fencer who initiated an attack was permitted to complete his movement, unless completely parried, before his opponent could in turn commence his attack. Modern rules of foiling and fencing are based on rules established in 1780 when the mask was introduced.

Fencing has had a lengthy history in England. As long ago as 1285 a statute forbade the teaching of fencing and the holding of tournaments within the confines of London. The reasons advanced were that fencing encouraged brawling, dueling, and ruffianism. Swordsmen were viewed by the city fathers with suspicion and disfavor, and this attitude continued until Henry VIII, a great lover of swordplay, granted written permission to a corporation of Masters of the Science of Defense, composed of the leading English and foreign masters. This organization was given a coat of arms and numerous privileges, including a monopoly on the teaching of fencing. When boxing was introduced into England at the end of the eighteenth century by James Figg, who was also considered a master fencer, fisticuffs and knuckle fights became extremely popular. Fencing was regarded as a provincial amusement. Its neglect continued until the middle of the next century. Between the two world wars fencing again became popular. Fencing is now taught in many American colleges and has recently become popular among women, for it is valued for the grace and muscular coordination it develops.

The standard weapon for fencing in the United States is the foil, a four-sided blade about 32 in. long with a rubber or leather tip at the end. Fencers wear vests which cover them from the neck to the hips. The object of fencing is to touch any part of an opponent's vest. To protect their faces contemporary fencers wear masks. When a fencer uses a saber, which has a blunt point and sharp edges along the entire front and one-third of the back of the blade, he tries to reach any part of his opponent's body except the legs.

Fencing matches are conducted between either individuals or teams of four, in which one member serves as an alternate. The first position in a match is the grip and salute. From the salute one assumes the "on guard" position. Points are scored by touching the opponent. In order to win a match, five touches must be made on the opponent's body. Because of its speed and action, fencing is a difficult sport to referee. A bout is ruled by a director and four judges, and a scorekeeper keeps the record of the progress of the bout. Fencers parry and attack on a strip about 40 ft. long and 6 ft. wide. This is marked off by a center line and two other parallel warning lines, 10 ft. from each end, beyond which the fencer may not step without penalty. In general the fencer today wears a mask, a padded jacket, and gloves.

In fencing certain special terms are employed. "Touche" implies a valid hit on the target. "Feint" is a movement designed to mislead an opponent. "Parry" constitutes a defense against a thrust. "Riposte" is a thrust made after a parry. "Remise" consists of a counterattack after the riposte. Although these terms are the conversational lifeblood of fencing, they have entered everyday parlance, signifying the extent to which fencing has affected our speech.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Serum Glutamic Oxalacetic Transaminase in Acute Myocardial Infarction. H. A. Dewar, N. R. Rowell and A. J. Smith. *Brit. M. J.* 2:1121-1125 (Nov. 8) 1958 [London].

Serial daily estimations of the concentration of serum glutamic oxalacetic transaminase (SGO-T) were made with the aid of a colorimetric technique in 34 attacks of myocardial infarction occurring in 28 patients who were admitted to the Royal Victoria Infirmary in Newcastle upon Tyne, England. The results obtained were compared with changes in erythrocyte sedimentation rate, temperature, and electrocardiograms. The peak concentration of SGO-T reached in the uncomplicated cases in these patients varied from 24 to 620 units, with a mean of 194 units, as compared with a mean of 19 units in 25 healthy adults. Two patients with myocardial infarction complicated by congestive heart failure, and with centrilobular necrosis of the liver found at autopsy, had peak levels of 950 and 8,400 SGO-T units.

Compared with the rise in temperature and the increase in erythrocyte sedimentation rate occurring after the myocardial infarction, the rise in serum transaminase level appeared 24 hours sooner. There was no rise in SGO-T level in 3 (9%) of the 34 attacks of myocardial infarction, no rise in temperature took place in 11 (33%) of the infarcts, and even the erythrocyte sedimentation rate remained normal in 7 (20%). The maximum elevation of the SGO-T level roughly corresponded with the electrocardiographic estimation of the size of the infarct if other causes of a raised transaminase level could be excluded. The most important cause of the liberation of SGO-T in substantial amounts in myocardial infarction is centrilobular necrosis of the liver secondary to cardiac failure. In small infarctions serial estimations of the level of SGO-T may show a characteristic curve even though the peak does not exceed 40 units. Estimations of the SGO-T level

are most useful (1) when the electrocardiogram is obscured by previous myocardial infarction, arrhythmias, bundle-branch block, left ventricular strain, and digitalis, (2) when extension of myocardial infarction is suspected, and (3) to distinguish between acute coronary insufficiency and myocardial infarction.

Serum Transaminase: Its Clinical Use in Diagnosis and Prognosis. R. Bruce, J. K. Todd and L. LeDune. *Brit. M. J.* 2:1125-1128 (Nov. 8) 1958 [London].

Serum glutamic oxalacetic transaminase (SGO-T) levels were estimated colorimetrically in 31 patients with myocardial infarction, whose average age was 60 years. In 23 of the 31 patients myocardial infarction occurred within 7 days before the estimations of the serum transaminase concentrations were obtained. Of the 23 patients with acute infarctions, 16 recovered and 7 died. The average peak transaminase value found in the 16 patients who recovered was 111 SGO-T units. The equivalent average figure for the 7 patients who died was 576 SGO-T units. The average time of peak transaminase level relative to the time of infarction was 62 hours after the infarction in the 18 suitable cases.

This small series of patients confirmed reports in the United States and Great Britain that recent myocardial infarction can be detected in some patients by a typical rise and fall in serum transaminase values before diagnostic electrocardiographic changes have occurred. The correlation of degree of rise in serum transaminase level with the size of the infarct and immediate outcome suggests that transaminase values of over 250 units are an unfavorable prognostic sign in that patients with these transaminase values do not usually recover. It is suggested that transaminase values should be estimated at 24-hour intervals from the time of infarction for at least 4 and preferably 7 days, or until the peak value is passed, if full information is to be obtained from the results. On several occasions estimation of the SGO-T level proved to be useful in assessing whether severe cardiac pain was due to prolonged angina pectoris or actual infarction, the transaminase results correlating in each case correctly with the electrocardiographic findings and subsequent clinical progress. No rise in transaminase levels was detected in 2 patients with pulmonary infarction, 2 with gallbladder dysfunction, 2 with cerebral episodes, and 6 with pneumonia.

The place of publication of the periodicals appears in brackets preceding each abstract.

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Observations on the Course of Achalasia Treated with Mechanical (Starck) Dilatation with Special Reference to Reflux. J. Wolf, D. Greenbaum and G. C. Hennig. *Am. J. Gastroenterol.* 30:487-496 (Nov.) 1958 [New York].

The authors studied 6 patients, between the ages of 22 and 64 years, with achalasia who had had mechanical dilatation of the cardia with the aid of a metal dilator. The patients' symptoms were re-evaluated, and esophagrams were obtained. A stomach tube of 34 F. caliber with a flexible metal obturator was passed into the esophagus; the duration of delay at the region of the cardia was timed and the "feel" of the hold-up noted. Under fluoroscopic control 240 ml. of barium sulfate-water suspension was injected through the Crump tube which was then withdrawn. Sixty milliliters of water was then given by mouth to wash down any barium that might have dripped from the tube. The patient was quickly placed on the tilt table, turned to the supine position, and tipped to a 20-degree Trendelenburg position; he was then observed by fluoroscope while the Müller maneuver was performed. In no instance was the barium suspension noted to reflux from the stomach. Roentgenograms were then taken during the Müller maneuver without moving the patient off the table or changing his position. The follow-up periods ranged from 6 weeks to 42 months. The duration of symptoms before the procedure varied from 6 months to 19 years.

The results of treatment by dilatation were usually apparent the day after the procedure when the patient was allowed his first meal. Most patients were then able to eat solid foods and rapidly gained weight. In 5 of the 6 patients the results of dilatation were considered good to excellent. Dysphagia, vomiting, or regurgitation disappeared; little or no pyrosis was present. One patient complained of slight heartburn 2 or 3 times a month for about one year after the procedure. Another patient required 2 dilatations because of only fair results after the first instrumentation. The second dilatation yielded excellent results. The patient who did not improve to a gratifying degree had the least amount of esophageal distention. Results for the first month after dilatation were good, but then he noted some recurrence of the symptoms. He had slight pyrosis and a sour burning taste in the throat when supine. It is assumed that this patient had a diffuse esophageal spasm which played a greater role than the spasm of the vestibular region.

The hold-up of the obturator-stomach tube at the cardia did not seem to correlate with the clinical success of the dilatation. One patient with good results had a 16-second hold-up, whereas the man with poorest results had a delay of only a few seconds. Nor did the degree of distention of the esophagus, as seen on the post-treatment roent-

genograms, correlate well with the amount of improvement. The patient with the least satisfactory results had the smallest amount of esophageal distention, and one with excellent results had little change in the large esophageal diameter after the dilatation. It appears that forcible dilatation, preferably with the Starck instrument because the operator can "feel" the degree of resistance without relying on pressure gauges, yields symptomatic relief in achalasia as adequately and as frequently as esophagocardiomyotomy. The morbidity, when the procedure is in experienced hands, is less than with surgery, and the long-term complications so far would seem to be less.

The Use of ACTH in the Diagnosis of Addison's Disease. B. D. Stacy. *M. J. Australia* 2:482-487 (Oct. 11) 1958 [Sydney].

Although Addison's disease is the best-known example of adrenal cortical insufficiency, great difficulty may be experienced in establishing the diagnosis, since none of the individual signs of the disease may be considered as pathognomonic of adrenal cortical insufficiency. Pigmentation, hyponatremia, and hyperkalemia all occur in a wide variety of conditions unassociated with Addison's disease. Although a number of laboratory tests for adrenal failure are available, the most successful procedures are those based on the effect of corticotropin (ACTH) on the excretion of urinary steroids. Unchanged levels of urinary 17-ketosteroids and 17-hydroxycorticosteroids after the administration of ACTH provide the surest evidence of Addison's disease. Several clinical ACTH tests have been described, differing mainly in the method of corticosteroid determination and mode of ACTH administration. In this paper the use of an intravenous test with ACTH is reported, the adrenal cortical function being assessed primarily from the urinary excretion of 17-hydroxycorticosteroids and secondarily from the excretion of sodium and potassium.

Fifteen patients were investigated because they bore suggestive signs of Addison's disease. Preliminary work was carried out on 3 patients by following changes in urinary constituents at intervals of 3 hours before, during, and after a single 6-hour infusion of ACTH. Although results were decisive in this single 12-hour test, the desirability of observing adrenal cortical response to sustained stimulation led to the work on a group of 12 patients, in whom 24-hour urine specimens were analyzed after treatment with ACTH for 2 or more days. In each group there were 2 patients who failed to respond to ACTH; that is, of 15 subjects suspected, 4 were shown to have the disease. Urinary 17-hydroxycorticosteroids provided a far more sensitive index of adrenal cortical function than urinary total neutral 17-ketosteroids, and en-

abled Addison's disease to be detected in one patient with adrenal amyloidosis, a condition that is rare and difficult to diagnose.

In the subjects who responded to ACTH, the increase in corticosteroid excretion after a single 8-hour infusion of the hormone was found adequate to exclude the diagnosis of Addison's disease; in subjects who did not respond, the results were best confirmed by 3 days' treatment with ACTH. The effect of ACTH on the urinary excretion of sodium and potassium provided a rapid indication of whether the infusion should be continued for more than one day. In this respect changes in the urinary sodium-potassium ratio were more decisive than changes in the number of circulating eosinophils. In several cases the ACTH test and the Kepler-Robinson-Power water excretion test gave conflicting evidence on the status of adrenal function.

Bananas as a Low-Sodium Dietary Staple. W. E. C. Wacker, M. Margoshes, A. F. Bartholomay and B. L. Vallee. *New England J. Med.* 259:901-904 (Nov. 6) 1958 [Boston].

The authors performed analyses for sodium and potassium on samples of the edible portion of bananas. Sodium is a trace element in this fruit, existing in concentration of less than 1 mcg. per gram of fresh fruit. Thus, the banana seemed to fit the requirements as a readily available, staple, palatable, low-sodium food which would be a useful dietary adjunct in the treatment of patients affected with salt-retaining conditions, such as congestive heart failure, cirrhosis of the liver, and nephrotic syndrome. Two patients, a 44-year-old woman, with rheumatic heart disease and tricuspid insufficiency associated with general anasarca, and a 63-year-old woman, with a postalcoholic cirrhosis of the liver and ascites, were placed on a banana regimen. The diet consisted of 10 bananas and 1,500 cc. of low-sodium milk. Profound diuresis resulted in both patients. The diet is simple to prepare and is well tolerated.

Leptospirosis: A Clinical and Statistical Study of 182 Cases. Chung Huei-Lan, Ch'iu Fu-Hsi, Wu Hsüeh-Tsung and others. *Chinese M. J.* 77:207-235 (Sept.) 1958 [Peking].

This paper deals with a clinical and statistical study of 182 cases of leptospirosis observed in the Kwangtung Central Area People's Hospital at Foshan, near Canton, from 1951 to 1955. From 1951 to 1954, 107 of the patients were studied; the remaining 75 patients were treated in 1955. A better understanding of leptospirosis by the medical personnel and a greater confidence of patients in hospital treatment may explain the increase in leptospirosis in 1955. While the disease occurred in Central Kwangtung throughout the year, its inci-

dence was highest in the summer and fall. The chief mode of infection was contact with water contaminated by rat urine. Most of the patients were male peasants, aged 16 to 45 years, who had become infected while working in paddy fields. The incubation period seemed to range from 4 to 19 days.

While generally the course of the disease showed 3 phases, namely, a period of fever, of jaundice, and of convalescence, some patients never became jaundiced. The onset was usually sudden, with fever and severe myalgia, particularly of the gastrocnemius. Later jaundice, various hemorrhagic phenomena, and oliguria developed. A small number of patients exhibited symptoms of central nervous system involvement or had anuria. The most common syndrome included tenderness of the gastrocnemius muscles, conjunctival congestion, hepatic enlargement, hemorrhagic manifestations, rapid pulse, and jaundice. A few patients had splenomegaly and signs of meningeal irritation. The majority of patients showed leukocytosis with an increased percentage of polymorphonuclear leukocytes. Many patients had mild anemia and thrombocytopenia. A marked increase in the erythrocyte sedimentation rate was a constant feature. The urine usually contained albumin, erythrocytes, leukocytes, casts, urobilin, and urobilinogen. Some of the patients had bilirubinuria. The phenol-sulfonphthalein excretion test indicated impairment of renal function during the height of the illness. The test for occult blood in the feces was positive in more than 50% of the patients. The protein content and the lymphocyte count of the cerebrospinal fluid were increased, whereas the sugar and chloride contents of this fluid were usually normal in the patients who had signs of meningitis. Patients with jaundice exhibited an increase in the serum bilirubin and in the icterus index. In some patients the albumin-globulin ratio was less than 1.

In 1955 the authors isolated 11 strains of *Leptospira* in 9 patients: in 4 from the blood, in 1 from the cerebrospinal fluid, and in 2 from the urine; in the remaining 2 patients, the strain was isolated from the blood and cerebrospinal fluid in one and from the urine and cerebrospinal fluid in the other. During August and September, 1954, 5 strains of *Leptospira* were isolated from 19 patients (3 strains from the blood and 2 from the cerebrospinal fluid). The strains were classified with the aid of standard types of immune rabbit serum as *Leptospira autumnalis*, *Lept. australis* B, and *Lept. canicola*. Fifty-six of the 75 patients studied in 1955 were subjected to 1 or 2 serologic examinations (leptospiral agglutination test and complement-fixation test). As regards the prognosis, old age, comatose state, intense jaundice, uremia, severe hemorrhage, high fever, impaired heart function, myocarditis,

pulmonary complications, late or inadequate treatment, fulminating infection, or poor general condition of the patient usually made it more unfavorable. The case fatality was 12 to 15.9%. Practically all the patients who died had jaundice. Only one of the nonicteric patients died. Most of the deaths occurred from 8 to 13 days after the onset. The main causes of death were severe damage to the liver, kidneys, and heart and profuse hemorrhage. Leptospirosis should be distinguished from epidemic virus hepatitis, malignant malaria, relapsing fever, typhoid, typhus, tsutsugamushi disease, influenza, epidemic encephalitis, and epidemic hemorrhagic fever. Therapy should be general and should aim at the protection of the vital organs that are threatened. Aureomycin and vitamin K are beneficial.

Cortisone and Tumors. E. Anglesio and A. M. Pelochino. *Minerva med.* 49:3854-3862 (Oct. 13) 1958 (In Italian) [Turin, Italy].

Thirty patients with malignant neoplasms of both sarcomatous and carcinomatous types received cortisone in daily doses of 30 to 100 mg. for a minimum period of 30 days. Some patients obtained local or general improvement, whereas the others derived no benefit from cortisone therapy. By "general improvement" is meant a decrease in toxicosis or fever, amelioration of appetite, and gain in weight. During cortisone therapy metastases developed in 1 patient with ovarian adenocarcinoma and in 3 patients with other types of carcinoma. It seemed plausible to ascribe the rapid development of metastases in these 4 cases to an exacerbating action of cortisone on the growth of the tumor.

The action of cortisone on malignant tumor seemed to be threefold: 1. The administration of cortisone caused an improvement in the feeling of well-being by antistress and disintoxicating effects. 2. Cortisone exercised a direct action on the tumor and on the "soil" factor through antimitotic, anti-anabolic, and possibly antiphlogistic and anti-allergic effects. This action reduced or blocked the development of the tumor at a certain phase of its growth. However, cortisone also seemed to weaken the reactive potency of the connective tissue and to block various cell elements and enzymatic activities. During this adverse phase of cortisone action, tumor cells restarted to grow, the old dormant ones were reactivated, and the existing tumors increased in size. 3. The third effect of cortisone was directed to the endocrine system by blocking the pituitary production of corticotropin and of somatotrophic hormone.

The authors conclude that the preceding 3 actions of cortisone on tumors are unpredictable in individual patients. The response of the organism to these actions is related to varying reactions of

single tissues and to the administration of cortisone at different times, as well as to the yet unclarified biological behavior of tumor cells.

Report of a Case of Pulseless Disease ("Disease of Takayasu"). I. L. Vural and R. Akdilli. *Presse méd.* 66:1636-1638 (Oct. 22) 1958 (In French) [Paris].

The authors report on a 46-year-old woman with pulseless disease of Takayasu, who was hospitalized in the medical clinic of Gülhane in Erzurum, Turkey, for headache, pain in the arms and in the masseter muscles, loss of weight, and sweating. The patient complained of vertigo, when in the erect standing position, and of specks seen floating before her eyes. Examination revealed absence of radial, brachial, and axillary pulses; the presence of a murmur in the left side of the chest, which varied both in quality and in location but was localized particularly in the left supraclavicular region; gradual diminution in the amplitude of the arterial pulsations; a slight rise in temperature; and increased erythrocyte sedimentation rate. Bacteriological blood culture yielded negative results. The blood count showed a mild hypochromic anemia. The patient refused catheterization of the heart and angiography, but the listed findings suggested a gradually developing obliterative process in the large collateral branches of the aorta, causing diminution and occasionally disappearance of the arterial pulsations and an insufficient circulation in the head, the neck, and the upper extremities.

The patient was treated with high doses of penicillin and with prednisolone (25 mg. daily for 20 days). She discontinued the treatment spontaneously, and an examination performed later revealed complete disappearance of the carotid pulsations, increased vertigo and muscular pain in the arms and jaw, and hemiparesis of the right side. Discussing the causation of the disease by referring to other cases collected from the literature, the authors state that the most frequently observed pathological changes are those of a brachiocephalic arteritis of unknown origin. The prognosis is unfavorable.

Bronchopulmonary Ornithosis: Clinical, Radiologic and Bronchologic Study on 41 Cases Observed in Northern France. C. Gernez-Rieux, C. Voisin, J. Leblois and others. *Semaine hôp. Paris* 34:2397-2405 (Oct. 18) 1958 (In French) [Paris].

The extensive serologic survey carried out for the last 3 years at the Institut Pasteur in Lille revealed the frequent occurrence of human ornithosis in northern France, where the breeding of pigeons is very popular. Serum taken from 1,430 persons showed the presence of complement-fixation bodies for ornithosis in 105, and 41 of these patients with a complement-fixation titer equal to,

or higher than, 1-40 were subjected to extensive clinical, biological, and epidemiologic investigation. Thirty-three of the 41 patients were men, and 8 were women. The ages of 4 patients were less than 30 years, and those of 8 ranged from 31 to 40 years, 29 persons were over 40 years of age. Ornithosis usually appeared under the mask of an atypical pneumonia (39 patients), but it was often associated with extrapulmonary and, particularly, nervous clinical manifestations (3). Diagnosis was rendered difficult in patients with pulmonary ornithosis by the disparity of the roentgenologic aspects, which included parenchymatous infiltration, pleural involvement, and ventilation disturbances simulating various pulmonary diseases. The patient with bronchial involvement deserves special attention: examinations performed, such as bronchoscopy in 27 patients, bronchial biopsy in 19, and bronchography in 18, clearly demonstrated the gravity of ornithosis in the acute stage of the disease, sometimes leading to irreversible bronchial conditions.

The ornithotic source of infection should always be suspected in patients exhibiting the syndrome of atypical bronchopneumonia. Correct diagnosis is of great importance in these patients; therefore, systematic serologic complement-fixation tests should be performed in the acute and in the convalescent stages of the disease. The treatment of patients with ornithosis is relatively simple. Since antibiotics belonging to the group of tetracyclines are effective against this virus disease, it is preferable to use these rather than penicillin or the sulfonamides. The authors administered Auromycin to patients of this series in doses ranging from 1.5 to 2.0 Gm. daily for a period of 2 or 3 weeks. The adjunction of bronchial therapy with occasional local application of epinephrine was particularly indicated in patients with roentgenologically confirmed ventilation disturbances. This therapy has given excellent results and seems to guarantee complete cure without relapse in human ornithosis.

The Use of Chlorpropamide as an Oral Hypoglycemic Agent. C. E. Bloedow. J. Oklahoma M. A. 51:655-658 (Nov.) 1958 [Oklahoma City].

Chlorpropamide differs from tolbutamide only in that it has one less methylene group in the side-chain and has a chlorine atom attached to the benzene ring instead of a methyl group. Thirteen diabetic patients were treated with chlorpropamide. A juvenile diabetic and a diabetic whose disease began in his third decade, both requiring 40 to 60 units of insulin daily, showed progressively increasing hyperglycemia, glycosuria, and acetonuria during a period of 3 days in which chlorpropamide, 1 Gm. daily, was substituted for insulin. On the other hand, 2 elderly

patients with very mild diabetes experienced severe hypoglycemic reactions, manifested by unconsciousness and blood glucose levels of 28 and 54 mg. per 100 cc., respectively, on this dose of chlorpropamide. Each of 9 other patients with mild diabetes mellitus responded satisfactorily to chlorpropamide therapy.

The same criteria that govern the selection of patients for treatment with tolbutamide apply to those being considered for treatment with chlorpropamide. The elderly, mild diabetic appears to be more prone to hypoglycemic reactions when treated with chlorpropamide than when treated with comparable doses of tolbutamide. The fasting blood glucose seems to reach a plateau during the 6th to the 11th day after therapy with chlorpropamide has been initiated. The onset of action of chlorpropamide is approximately the same, but the duration of action is greater than that of tolbutamide. Gram for gram, chlorpropamide seems to be a more potent hypoglycemic agent than tolbutamide. This could be due to greater potency of chlorpropamide at equivalent blood levels, to better absorption of chlorpropamide than tolbutamide, or to slower detoxification and excretion of chlorpropamide.

SURGERY

Continued Morbidity After Mitral Valve Surgery. M. M. Zion and J. L. Braudo. South African M. J. 32:929-932 (Sept. 20) 1958 [Cape Town].

Approximately 70% of patients who undergo valvotomy for mitral stenosis obtain good results, and in the great majority the result is lasting. However, in view of the large number of patients who have undergone mitral valvotomy, the absolute number of those with poor results is considerable. A clinic was opened under the aegis of the cardiac clinic at the Johannesburg General Hospital for the purpose of following up patients who had undergone mitral valvotomy. It became obvious that the great majority of the patients attending the clinic were those with continuing ill-health. Thus, of more than 300 patients subjected to mitral valvotomy, only 98 could be followed. Forty-two had good, 16 fair, and 40 poor results. Some of those with "good results" attending the clinic were troubled by temporary complications, and they often ceased attending when the complications abated. The problems of the patients who continued to come to the clinic could be divided into the following groups: (1) the postcommisurotomy syndrome; (2) inadequate enlargement of the mitral valve orifice (3) late restenosis of the mitral valve; (4) repeated mitral valvotomy; (5) persistent right heart failure and/or tricuspid incompetence; (6) combined mitral stenosis and mitral incompetence; and (7) a miscellaneous group of poor results de-

spite adequate operative enlargement of the mitral valve. These different groups are discussed, and illustrative case histories are presented.

The clinical picture of the postcommissurotomy syndrome consists of recurrent bouts of fever, with chest pain and, in some patients, evidence of pericarditis and left-sided pleural effusion. With regard to the inadequate enlargement of the mitral valve orifice, the authors say that technical difficulties may preclude an adequate split, and it may well be that restenosis soon follows inadequate enlargement. Late restenosis in subjects who have had adequate valvotomy is rare and is usually attributable to recurrent rheumatic activity. As regards group 4, the authors say that patients with early or late restenosis may be subjected to repeated valvotomy, and this may be technically more difficult than the initial operation, partly because of more difficult entry into the previously opened left atrium. Persistent right heart failure and/or tricuspid incompetence were observed in 8 patients who, after a satisfactory valvotomy, experienced improvement in exercise tolerance. The reason for persistence of signs of right heart failure is not clear, and hemodynamic investigation of these patients is planned. Three possibilities are mentioned: persistence of increased pulmonary arterial resistance, irreversible myocardial damage, and organic tricuspid disease. Whatever the explanation, these patients continue to require medical therapy for control of their right heart failure.

In patients in whom mitral incompetence is associated with stenosis, the proportion of good results falls short of that obtained in patients without incompetence, and, even though the surgeon has reported "no increase of regurgitation" at operation, the clinical course may continue steadily downhill. These patients seem to follow the natural history of mitral incompetence, and possibly their stenosis was not a factor in causing the symptoms. With regard to group 7 (poor results despite adequate postoperative size of the mitral valve), the following explanations are considered possible: (1) associated valvular defects which preoperatively were considered insignificant; (2) presence or development of essential hypertension or ischemic heart disease; (3) unrecognized rheumatic activity; (4) persistence of chronic bronchial infections; and (5) development of permanent atrial fibrillation, not present preoperatively.

Problems and Experiences in the Surgical Treatment of Tetralogy of Fallot. R. H. Betts and N. Gopinath. *Indian J. Surg.* 20:297-303 (Aug.) 1958 (In English) [Madras].

The authors report on 47 patients, between the ages of 2 months and 22 years, who underwent shunt operations for correction of the tetralogy of Fallot in the department of thoracic surgery of

the Christian Hospital in Vellore, South India. Of the 6 patients operated on between 1951 and 1953, 4 underwent a Potts-Smith operation and 2 had a Blalock-Taussig operation; only 1 of these 6 patients is still alive. Of the 41 patients operated on between 1954 and 1957, 3 had operations of the Potts type and 38 had a Blalock operation. The 2 operative deaths and the 1 late death in this group of patients operated on since 1954 all occurred after a Potts operation, although the authors do not believe that the operative procedure was responsible except for the 1 late death resulting from congestive failure. The 2 operative deaths were due to an error in diagnosis in one case and an abnormal additional valvular cusp in the other. There has been only one operative death, and no late deaths, in the group of patients that had the Blalock operation. The moderate hypothermia (not below 32 C [89 F]) used in the past 2 years has been a beneficial factor.

Autopsy was performed in 2 of the cases of operative death; it revealed that one patient did not have a tetralogy of Fallot, but an extremely marked infundibular pulmonary stenosis with an auricular septal defect. Despite all diagnostic tests it may sometimes be most difficult to establish the diagnosis preoperatively, especially in younger patients. The authors agree with other workers that patients who survive the immediate postoperative period continue to do well and are greatly improved by a systemic-pulmonary shunt operation. A direct attack on the pulmonary stenosis and the ventricular septal defect does not seem justified until improved surgical methods have been developed.

Tracheal Fenestration as a New Method of Treatment for Advanced Emphysema. E. E. Rockey, S. A. Thompson, C. F. Blazsik and K. J. Ahn. *New York J. Med.* 58:3607-3615 (Nov. 15) 1958 [New York].

Tracheal fenestration is a new method of treatment for chronic respiratory diseases, including that group of respiratory insufficiencies known as chronic bronchitis and emphysema. A 3-to-4-in. transverse skin incision is made over the midpart of the anterior surface of the neck below the cricoid cartilage. The incision is then extended in such a way that one skin flap is outlined above and one below the level of the initial transverse incision. The incision for the flaps starts about one-half to three-fourths of an inch from the midline. The skin incision is carried down to the subcutaneous tissue only. Through the original transverse incision the platysma is incised in a transverse direction to about an inch distal to the right and left of the midline. The trachea is then exposed by splitting the strap muscles. Portions (1.25 cm. in length) of two adjoining tracheal rings are excised with the

underlying mucosa. The newly created tracheal window edges are covered by inverting the full thickness of the skin flap. These and the further steps in the tracheal fenestration are illustrated by diagrams. The operation results in a permanent tracheocutaneous fistula, which is guarded by skin valves that provide a means of ready access to the tracheobronchial tree when open, and when closed reestablish the normal tracheal air tract. The two skin valves normally are in apposition and prevent leakage of air or liquid. These valves may be manually opened and thus provide entrance to the tracheobronchial tree.

The authors describe their experience with tracheal fenestration in 6 patients, giving detailed histories of 4. Two of the 4 patients had cough and purulent expectoration, whereas the other 2 had not; in other words, 2 had emphysema with suppuration, whereas the other 2 had "dry" emphysema. All 4 were completely disabled by dyspnea, even at rest. Tracheal fenestration brought palliative relief to 2 of these respiratory cripples. The other 2 patients were sufficiently rehabilitated to leave the hospital without respiratory difficulties. These results were accomplished by repeated and effective tracheobronchial aspiration, which was performed by the patients themselves. At each aspirating session a larger catheter was used first and then a smaller one. The patients easily learned how to insert these catheters into the right or the left lung. Some of them also learned how to insert them into any of the lobes. Six to 8 catheter insertions were done at each aspirating session. By the time the 2 patients were ready for discharge from the hospital, the one with "dry" emphysema needed only 2 daily aspirating sessions, but the one with "wet" emphysema needed 4 or 5 daily aspirating sessions. Two other patients (the 5th and 6th) with advanced emphysema underwent tracheal fenestration quite recently and are doing well.

The authors list the following indications for tracheal fenestration: (1) advanced emphysema with marked respiratory disability; (2) suppurative diseases of the lungs when excisional surgery is contraindicated; (3) fibrocystic disease of the pancreas with excessive pulmonary suppuration; (4) far-advanced active pulmonary tuberculosis for which no other form of therapy can be offered; and (5) bulbar type of poliomyelitis with irreversible changes, requiring a mechanical respirator.

Alveolar Cell Carcinoma. C. R. Kessler. *Am. Surgeon* 24:793-798 (Nov.) 1958 [Baltimore].

Alveolar-cell carcinoma is a primary malignant tumor of the lung. There is disagreement as to its proper name, cause, origin, and treatment. The tumor has been variously called papillary gelatinous adenocarcinoma, primary alveolar-cell tumor, pulmonary adenomatosis, mucocell papillary adeno-

carcinoma, diffuse epithelial hyperplasia, diffuse primary alveolar epithelial carcinoma, malignant adenoma, cystic papillary lung tumor, mucopitheiial hyperplasia, etc. It has been suggested that perhaps the apparent multicentricity of the tumor is caused by air-borne metastases rather than multiple points of origin. The similarity between this tumor in man and an epidemic disease in sheep called jaagsiekte has stimulated thought that perhaps this (and maybe all neoplastic disease) is caused by an ultramicroscopic agent such as a virus. Though the disease in sheep does occur in epidemic proportions, it has never been experimentally transmitted from one animal to another.

Alveolar-cell carcinoma differs from other pulmonary neoplasms. It occurs in 3 forms: (1) as a multiple nodular growth distributed throughout one or both lungs; (2) as a diffuse form involving uniformly one lobe or more; and (3) as a focal disease in a limited area. The diffuse form shows evidence, grossly and microscopically, suggesting that it is the result of coalescence of a multiple nodular form. The diffuse form resembles a pneumonia or an atelectasis, and the focal form resembles a tuberculoma. It has been reported that pleuritis with fibrinous or serous exudate and adhesions usually are present, but in at least 8 of 9 cases in this report no pleuritis was found. Furthermore, whereas others stated that cavities and bronchiectasis are rare in patients with alveolar-cell carcinoma, 2 of the 9 patients presented showed definite cavities and 1 of the 9 showed bronchiectasis. Microscopically, the prominent feature is that the intra-alveolar septums are lined with, but not invaded by, cells which vary from high cuboidal to columnar in type, with all degrees of proliferation and with some papillary projection into the alveolar lumen. The cytoplasm is clear and may be pink-stained because of a large amount of mucus. There is marked pleomorphism in the size of the cells and the nuclei.

The 9 patients described here included 5 women and 4 men, although generally the disease is slightly more frequent in men. There is no consistent relationship to smoking. In many patients no symptoms whatever are present, and the lesion is found on routine chest survey. Typically, patients do have cough productive of clear mycoid sputum. Dyspnea becomes a feature in many of the patients as more lung tissue becomes involved. Once symptoms such as dyspnea and productive cough develop, they are usually progressive to a fatal end, with the rapidity varying from case to case. Sputum examinations yield tumor cells in a high percentage of patients, but roentgenologically alveolar-cell carcinoma usually cannot be differentiated from bronchogenic carcinoma, metastatic carcinoma, tuberculosis, or sarcoidosis. Bronchoscopy and bronchography are usually of little value except that in some cases positive bronchial washings can

be obtained. The diagnosis of alveolar-cell carcinoma is very difficult to make during life and can be established with certainty only by tissue diagnosis from resected portions of the lung. Occasionally a late case can be diagnosed by lymph-node biopsy. Treatment has been largely unsuccessful, as in other lung tumors. Occasional 5-year survivals occur when early focal disease is resected. This speaks for early exploratory thoracotomy of small, asymptomatic densities, as seen on routine chest roentgenoscopy.

Alimentary Hypoglycemia Following Gastric Resection. A. J. R. E. van Schoonhoven van Beurden. *Nederl. tijdschr. geneesk.* 102:1894-1898 (Sept. 27) 1958 (In Dutch) [Amsterdam].

In patients who have undergone gastric resection, it is desirable to distinguish between the dumping syndrome and the hypoglycemic syndrome. The latter may follow the dumping syndrome, or the 2 syndromes may merge into each other. Low blood sugar values in the classical sugar tolerance test indicate a tendency to hypoglycemia. In some patients with the hypoglycemic syndrome the sugar tolerance test curve does not reveal extremely low values, but the fall is more rapid in these patients than would normally be the case. Conversely, a low blood sugar level is not necessarily associated with the clinical symptoms of hypoglycemia.

The postoperative alimentary hypoglycemia is not connected with the ulcer disease but rather with the gastric resection. It may develop after a Billroth 1 as well as a Billroth 2 operation. Changing the condition resulting from a Billroth 2 operation to that resulting from a Billroth 1 operation is not followed by improvement. The cause of the postoperative alimentary hypoglycemia is unknown, but it may be the result of excessive secretion of insulin as a pancreatic reaction to excessive sugar absorption from the small intestine (so-called functional hyperinsulinism). Satisfactory results were obtained in 5 patients who were treated with frequent low-carbohydrate meals. The oral administration of prednisone raised the blood sugar level in 3 patients but failed to do so in 2. The author feels that in patients with severe alimentary hypoglycemia prednisone therapy should be tried.

The Value of Scalene Node Biopsy in Intrathoracic Disease. H. C. Nohl. *Brit. J. Tuberc.* 52:286-290 (Oct.) 1958 [London].

The author performed scalene node biopsy for the diagnosis of intrathoracic disease in 58 patients, 41 of whom had palpable supraclavicular lymph nodes and 17 had impalpable nodes. A positive scalene node biopsy was made in 36 of the 41 patients and in 5 of the 17 patients. Of the 36 patients, 22 had bronchogenic carcinoma, 4 had

sarcoidosis, 1 had reticulosis, 2 had tuberculosis, 2 had Hodgkin's disease, 1 had malignant pleural effusion, 2 had carcinoma of the esophagus, 1 had carcinoma of the stomach, and 1 had a small neurilemmoma. Of the 5 patients, 4 had sarcoidosis and 1 had bronchial carcinoma. The author was convinced of the value of scalene node biopsy as a diagnostic procedure. The percentage of positive biopsies depended on the thoroughness with which the surgical intervention was carried out, and it was especially high for patients with sarcoidosis. The results bore out the author's previously published views on the lymphatic drainage of the lungs and afforded a guide as to which side of the chest should be explored. Right-sided lesions always give rise to pathological changes on the right. In patients in whom no lymph nodes are palpable, the right supraclavicular region should be explored irrespective of whether the chest lesion is on the left or the right side. Similarly, in bilateral lesions a scalene node biopsy on the right is advised. Only when the left supraclavicular nodes are palpable should this side be operated on. A bilateral exploration is justifiable only in cases in which a right-sided scalene node biopsy is negative and the diagnosis cannot be made by any other means. In all the patients but 3 of this series, the diagnosis was made ultimately, if not by scalene node biopsy then by bronchoscopy, pleural or lung biopsy, sputum cytology, or thoracotomy.

Observations on a Parapharyngeal Tumor of Glomic Origin Arising from the Mixed Nerves and the Hypoglossal Nerve. D. Petit-Dutaillis, J. A. Chavany, H. Fischgold and others. *Semaine hôp. Paris* 34:2389-2396 (Oct. 18) 1958 (In French) [Paris].

The authors report on a parapharyngeal tumor of glomic nature, associated with a tumor of the same nature arising from the hypoglossal loop, in a 46-year-old woman. The clinical history of this patient puzzled neurologists and various specialists for a long time, because for 6 years a paroxysmal cough, resembling whooping cough and associated with occasional vomiting, was the only symptom manifested. Then spells of itching appeared in the throat, with lightning-like radiations along the course of the nerve in the fossa carotica, later radiating to the thorax and to the epigastrium. A tentative diagnosis of a duodenal ulcer was made. Suddenly, without any concomitant disorder of deglutition, the patient's voice became hoarse, and an otolaryngologist established paralysis of the recurrent laryngeal nerve on the right side. The occurrence of dull pain in the neck, radiating to the right external ear and shoulder, was attributed to transmission deafness caused by a functional defect in the eustachian tube. The appearance of a bulge in the nasopharynx, compressing the ton-

sillar region on the right, was the first sign leading to correct diagnosis, and by means of tomography and phlebography the precise extracranial localization of a tumor of the parapharyngeal segment arising from the vagus nerve was established. The other tumor arising from the hypoglossal nerve, which manifested itself in fibrillation of the right half of the tongue, was discovered only during the operation.

The value of Pierre Duval's incision (premastoid incision combined with a section of the mastoid process) is emphasized; by this method the complete removal of the 2 tumors and their separation from the adherent large vessels in this patient were greatly facilitated. Six months after the operation the patient showed progressive adjustment to the various functional disturbances resulting from the performed exeresis, but because of a new sign, consisting of right hemifacial enlargement, she was subjected to roentgenotherapy applied to the site of operation. When last seen, 2 years after the operation, she was well and was leading a normal life, although she still had spells of the coughing. The authors compare their observations on this patient with those rare cases of glomic tumors arising from the vagus nerve reported in the literature.

Scurvy Following Bilateral Adrenalectomy: Report of 2 Cases. D. Chamberlain and N. V. Addison. *Brit. M. J.* 2:1128-1130 (Nov. 8) 1958 [London].

The authors report on 2 women, aged 37 and 62 years, with advanced cancer of the breast, who underwent bilateral adrenalectomy and oophorectomy. Several days after the adrenalectomy the wounds became infected with *Staphylococcus pyogenes* var. *aureus*, and on the 11th postoperative day in one patient and on the 10th day in the other, purpuric spots appeared and hemorrhages occurred in the upper and lower extremities. The vitamin C saturation test revealed a marked vitamin C deficiency, the patients excreting only 21 and 31 mg. of ascorbic acid, respectively, in the urine. A diagnosis of scurvy was made, and the patients were given 300 mg. of ascorbic acid daily by mouth; the purpuric spots disappeared in the first patient and diminished in number in the second.

The adrenal cortex is the main storage depot of vitamin C in man. The release of cortical hormones is associated with an increased excretion of ascorbic acid and a reduction in the content of ascorbic acid in the adrenal gland itself. The presence of infection is believed to cause vitamin C to be utilized more rapidly and thus deplete the limited reserves. It is a question whether vitamin C is concerned with the actual synthesis of the adrenocortical steroids, but it is suggested that the power of the adrenal cortex to secrete the hormones is dependent on the presence of ascorbic acid. The

authors believe that patients who have their adrenal glands and ovaries removed tend to have a lowered reserve of vitamin C immediately after the operation. They suggest that these patients should be given an adequate intake of ascorbic acid to prevent the occurrence of deficiency symptoms.

Results of Conservative Management of Cancer of the Rectum in Poor Risk Patients. J. H. Wittoesch and R. J. Jackman. *Surg. Gynec. & Obst.* 107:645-650 (Nov.) 1958 [Chicago].

Although radical surgical procedures offer the patient with cancer of the rectum the best chance for cure, good judgment on the part of the clinician and surgeon dictates that certain patients with associated cardiovascular disease, senility and general disability, severe hypertension, diabetes, and so on be managed by conservative methods. Surgeons at the Mayo Clinic often were surprised at the good results obtained by conservative methods in some of these poor-risk patients. To find out about the further course of a group of these conservatively treated patients with cancer of the rectum, the authors studied the records of all of those managed in this manner at the Mayo Clinic during the 5-year period from 1945 through 1949. They found records of 128 patients for whom normally radical surgical treatment would have been applied, but for whom, because of some associated debilitating condition or refusal of the patient to submit to radical procedures, the clinician and surgeon had decided on some less drastic procedure. In the 5-year period under consideration approximately 1,900 additional patients underwent radical surgical treatment for carcinoma of the rectum, so that the series of 128 managed conservatively represents only about 6% of the total cases.

The nature of the conservative treatment carried out was as follows: fulguration, 28 cases; local excision, 19; irradiation (radium), 50; irradiation (roentgen-ray), 3; fulguration and radium treatment, 18; fulguration and excision, 2; excision and radium treatment, 6; and radium and roentgen-ray irradiation, 2. Because of obstructive symptoms developing later, it was necessary subsequently to perform colostomies in 10 cases. Although the nature of the conservative treatment has to be individualized, the authors gained the impression that fulguration, immediately followed by the topical application of a radium pack, has been the most satisfactory. They feel that, if one considers the morbidity and mortality associated with the radical surgical treatment in certain poor-risk patients with carcinoma of the rectum, it seems good clinical judgment to offer these patients the benefit of conservative treatment. Although this is sometimes spoken of as "palliative treatment," it is curative in more instances than is generally appreciated. That 54 of a

series of 116 patients were living more than 5 years after the initial conservative treatment, that 6 were living more than 10 years later, and that 24 of the 75 deaths were unrelated to the rectal carcinoma has led the authors to believe that many of these poor-risk or refusal patients can be salvaged by conservative methods.

Necrobiosis Lipoidica Diabeticorum. J. W. Kelley. *Plast. & Reconstruct. Surg.* 22:342-347 (Oct.) 1958 [Baltimore].

Necrobiosis lipoidica diabeticorum was first described under the title of "dermatitis atrophicans lipoides diabetica," but most of the reported cases have appeared under the term, "necrobiosis lipoidica diabeticorum." Although it was suggested that *necrobiosis lipoidica diabeticorum* and *granuloma annulare* represented variants of the same disease, it is now generally agreed that they are two distinct processes. Vascular changes in the small arterioles are thought to play a major role in lowering the resistance of the involved part, but the exact mechanism of the process remains a mystery. While the lesions may result from trauma, they have also appeared spontaneously with no history of injury. Prior to 1954-1955 diabetes mellitus was recorded in 80 to 90% of patients with *necrobiosis lipoidica diabeticorum*, but more recent observations indicate that diabetes mellitus exists in less than 50% of the patients. *Necrobiosis lipoidica diabeticorum* is found chiefly in women (ratio of 9:1). The average age of onset is the third decade. The lesions are usually asymptomatic except for mild pruritus and burning. When the dermatosis becomes infected and ulcerates, the patients complain of pain as well as other discomforts. The lesions are almost always located in the anterior tibial area, but about 8 to 9% occur on the upper extremities or other parts of the body.

Necrobiosis lipoidica diabeticorum was considered a medical or dermatological problem until Cawley and Dingman in 1951 excised two large involved areas on the shins of a 57-year-old woman and covered them with split-thickness grafts. The recovery was excellent, and the ulcerations did not recur. This appears to be the treatment of choice in chronic ulcerations, even though there are dangers from the underlying occlusive vascular changes. The patient whose history is described was a 19-year-old woman who had had diabetes mellitus for approximately 7 or 8 years, but the diabetes had been adequately controlled. Approximately one year prior to the initial examination, the patient had been hit across both shins with a hockey stick. Subsequently rather large ulcerations developed in the anterior tibial areas of both legs. The patient had been treated by several dermatologists with numerous topical applications, but in spite of this and good control of her diabetes, the

ulcerations persisted. Surgical excision was advised. In preparation for the excision and grafting, warm saline compresses were applied, and 4 or 5 days later the entire involved areas were excised. Since there was severe oozing, it was thought advisable to pack the areas open for 24 to 48 hours and then apply the grafts. Two days later split-thickness grafts, taken from the buttocks area, were applied to the denuded areas. The grafts took very well. Approximately 3 years later, another ulcerated area developed below the graft on the left lower extremity. Because of the persistence of this new ulceration, excision and skin grafting were carried out. This graft also healed well, and there has been no further ulceration.

Experiences with the Surgical Treatment of Aneurysms of the Abdominal Aorta. J. H. Mahaffey. *J. Kentucky M. A.* 56:1103-1109 and 1154 (Nov.) 1958 [Louisville].

The author reports on 5 men and 2 women, between the ages of 57 and 74 years, who underwent elective resection of a nonruptured arteriosclerotic aneurysm of the abdominal aorta at the Louisville General Hospital between September, 1955, and March, 1958. The primary symptoms were abdominal discomfort and an abdominal mass which in 2 patients was noted to be definitely enlarging over a period of 2 to 6 months. Two men had previous myocardial infarctions, and abnormal electrocardiograms were obtained from a third. Translumbar abdominal aortography was performed on the first 4 patients; on the last 3 patients it was not done, since involvement of the renal arteries by the aneurysm was not suspected. After resection of the aneurysm continuity of the blood flow was reestablished by the insertion of a freeze-dried abdominal aortic homograft or a suitable synthetic vascular prosthesis. All the patients survived the elective resection of the aneurysm and are still living 2 to 17 months after the surgical intervention. One woman with severe hypertension had retinal hemorrhages 6 months after the operation and had a stroke 8 months later. During the same period 2 men and 2 women, between the ages of 59 and 85 years, underwent resection of ruptured aneurysms of the abdominal aorta; only 1 of the 4 patients survived the operation.

The mere presence of an aneurysm alone without symptoms does not constitute an absolute indication for surgical intervention in the poor-risk patient. The final decision as to whether to operate on this type of patient should be left to the surgeon. The development of symptoms referable to the aneurysm or an increase in the size of the aneurysm is a definite indication for rather immediate surgical intervention which can convert a hopeless prognosis into a relatively more favorable one. The age of the patient, the amount of physical

activity until the time of rupture of the aneurysm, the degree of generalized arteriosclerosis, and the duration of perforation of the aneurysm before the resection are important factors influencing the recovery rate. The mortality rate among patients with ruptured aneurysms, treated by aortic resection and replacement of the vessel should be about 40%. In an addendum, the author states that 2 additional patients with arteriosclerotic aneurysms of the abdominal aorta involving the bifurcation of the vessel were operated on: one died on the 5th postoperative day of oliguria and sudden hypotension; the other, when last seen 10 weeks after the operation, had continued to do well.

Spontaneous Regression of Cancer. T. C. Everson. *Connecticut Med.* 22:637-643 (Sept.) 1958 [New Haven].

The author evaluated more than 1,000 cases of spontaneous regression of cancer collected from the world medical literature or obtained by personal communication. To date, only 90 of these cases have been considered to have adequate documentation, including histological confirmation of the diagnosis of malignancy, to accept them as probable examples of spontaneous regression of cancer, i. e., the partial or complete disappearance of a malignant tumor in the absence of all treatment or in the presence of therapy which is considered inadequate to exert a significant influence on neoplastic disease. From the tabulation of these 90 cases according to the type or location of tumor involved, it appeared that spontaneous regression of cancer was most commonly noted in patients with neuroblastoma (19), malignant melanoma (11), chorioepithelioma (9), and carcinoma of the bladder (9). Possible factors for spontaneous regression of cancer include endocrine influences, unusual sensitivity to inadequate irradiation or other therapy, fever and/or infection, allergic (immune) reactions, interference with the nutrition of the tumor, and removal of the carcinogenic agent.

Evidence of spontaneous regression of cancer is significant from several standpoints. Its existence, in at least some cases, supports the concept of biological control of cancer and reinforces the hope that a more satisfactory method of treating cancer than surgical intervention and/or irradiation may be found. The occurrence of spontaneous regression of cancer shows the need for caution in the assessment of the value of chemotherapeutic and unorthodox therapeutic measures in "isolated" cures of cancer. The remote possibility of spontaneous regression of cancer must be considered in the evaluation of the prognosis of certain cancers, and it may be of some psychotherapeutic value in a patient with cancer which is not amenable to surgical and/or irradiation treatment.

Satisfactory Surgical Correction of Pectus Excavatum Deformity in Childhood: A Limited Opportunity. K. J. Welch. *J. Thoracic Surg.* 36:697-713 (Nov.) 1958 [St. Louis].

Of 138 children with moderate to severe pectus excavatum deformity, who were evaluated between 1951 and 1958 with regard to the desirability of surgical correction, 76 (53%) were operated on in the pediatric surgical service of the Boston City Hospital. There were 49 boys and 27 girls, ranging in age from 8 months to 14 years. Multiple chondrotomies with suture fixation were performed on 34 patients. Subperichondrial resection with transverse sternotomy, which proved to be less hazardous than the previous method, was performed on 39 patients. Two patients underwent xiphoidectomy and retrosternal freeing, and 1 had cartilage resection with rib strut. There were 2 operative deaths, both in connection with anesthetic management. The 74 surviving patients were followed up from less than 1 year to 6 years or more. Some degree of recurrence developed in 7 patients, in whom the results, therefore, were considered unsatisfactory even though the deformity was subsequently corrected by a second operation in 3. An excellent result was achieved in 67 patients.

Studies of cardiopulmonary function are reported. These indicate that within the ideal elective period for surgical intervention, i. e., between the ages of 2 and 5 years, there is no objective evidence of abnormal function. There is no evidence of pulmonary insufficiency until the volume of the thorax is grossly reduced below normal in the first decade of life. Two patients had reduction in pulmonary function to the 50% level. They were not returned to normal levels by elevation of the sternum. Surgical correction at a later age, although cosmetically partially effective, does not convert the habitus of these patients to normal. When there is objective evidence of a cardiopulmonary handicap, their condition may be improved from severe to better, but they are not returned to a normal range. Because of the inability to predict the future course of children with marked, progressive pectus excavatum deformity, they should be recommended for surgical intervention by the third year of life if they are to be restored to normalcy in all cases.

NEUROLOGY & PSYCHIATRY

Neurological Syndromes Associated with Carcinoma: The Carcinomatous Neuromyopathies. R. Brain and R. A. Henson. *Lancet* 2:971-974 (Nov. 8) 1958 [London].

The natural history of the various types of neurological disorders associated with carcinoma in the absence of relevant secondary deposits has been

studied in 42 patients; 20 patients have been reported on previously, an abstract of one report having been published in *THE JOURNAL* (147:700 [Oct. 13] 1951). In all these patients there was histological proof of the diagnosis of carcinoma, while 22 postmortem examinations proved that the syndromes described were not due to secondary deposits. Thirty-two of the 42 patients (23 males and 9 females) had carcinoma of the lung, and in the remaining 10 the ovaries, prostate, rectum, and breast were involved. Of the 42 patients, 8 had cortical cerebellar degeneration with the clinical picture of subacute or even acute cerebellar disorder. Vertigo, ataxia, severe cerebellar deficit in the limbs, dysarthria, diplopia, and nystagmus were present. All but one of the patients deteriorated mentally. The disability in some cases progressed so rapidly that in a matter of a few weeks the patient was unable to walk or stand. This form of carcinomatous neuromyopathy has been associated with carcinoma of the lung, breast, and ovary.

Seven patients among the remaining 34 presented mixed forms of neuromyopathies. The only cerebellar change found in this group was degeneration of the cells of the dentate nucleus coupled with a loss of fibers in the superior cerebellar peduncles. Degeneration of the pyramidal tracts and posterior columns in the spinal cord, cellular infiltration of the meninges, and perivascular cuffing of the vessels of the spinal cord and of the medulla below the floor of the 4th ventricle were found. Bulbar palsy, ptosis, and weakness of external ocular movements occurred. All but 1 of the 7 patients were severely disabled over periods ranging from 3 months to 2 years. The underlying cancers were in the lung and breast.

There remain 27 patients, 5 of whom presented motor and sensory symptoms of the usual type, though not of the pure type, for dementia and extensor plantar responses were present on occasion. Complete remissions occurred in 2 patients. Symptoms due to cancer developed in one patient 6 months after the remission. Another 5 among the 27 patients showed degeneration and loss of neurons in the posterior root ganglions, with associated degeneration of the peripheral nerves and posterior columns. Clinically, the picture was one of a pure sensory neuropathy without motor weakness. Associated symptoms included gross hysteria in 2 patients, dementia in 1, and extensor plantar responses in 1. The course varied from 2 months to more than a year. All these patients had carcinoma of the lung. The remaining 17 patients presented neuromuscular disorders. The onset of symptoms was usually subacute with a history of a few weeks or months. Weakness affecting limb girdles and trunk, as well as diplopia, ptosis, and bulbar paresis, occurred. There was clinical evidence of nervous lesions in some patients, sometimes even dementia.

Patients with such evidence of neural lesions occasionally had myasthenia weakness responsive to neostigmine therapy. Postmortem examinations on 7 patients and the performance of muscle biopsy on 4 yielded no clues as to the site of the lesion responsible for the muscular wasting.

In none of the patients examined post mortem have cerebral metastases been found, nor have representative sections of the brain shown any microscopic infiltration. Treatment has been directed toward the associated cancer. Physical therapy is helpful in patients with neuromuscular disorders, and neostigmine should be employed in the myasthenic cases. Cortisone is advised for patients with dermatomyositis. Vitamin therapy has not been of value.

Sequelae of Primary Aseptic Meningo-Encephalitis: A Clinical, Sociomedical, Electroencephalographic and Psychological Study. R. Miller, I. Nylander, L.-E. Larsson and others. *Acta psychiat. et neurol. scandinav.* (suppl. 126) 33:1-115, 1958 (In English) [Copenhagen].

The authors report on 135 male and 103 female patients, between the ages of 5 and 39 years, who were treated for primary aseptic meningoencephalitis at the hospital for infectious diseases in Stockholm between 1946 and 1954 and who underwent a clinical, sociomedical, electroencephalographic, and psychological examination during 1956. Of the 238 patients, 78 were less than 15 years of age at the onset of the disease. For more accurate evaluation of the results of these examinations, 138 other persons submitted to the same examinations as a contrast group. They were selected in such a way as to be comparable with the patients according to the "social twin" principle. Meningoencephalitis had not been diagnosed in any of the contrast group.

No significant differences were found between the 2 groups with regard to the incidence of various mental symptoms, the number of symptoms per person, the degree of severity of these symptoms, or the character of the principal mental symptoms. Headache was more common in the patients, but the degree of severity was the same in both groups. Two patients had epilepsy, 2 had tonic pupils, and 2 had endocrine disorders. None of these conditions were observed in the contrast group. The 2 groups did not differ in any important way with respect to occupational status, school performance, and social adjustment. The incidence of abnormal electroencephalograms was higher among the patients. The differences were small but probably not due to chance. The results of the electroencephalographic examination in the patients showed no correlation with the clinical data or with the psychometric findings. The psychological

examination revealed no noteworthy differences between the younger patients and their "social twins." The performance of the adult patients, on the other hand, was almost invariably poorer than that of their "social twins." This may have been a result of the meningoencephalitis, but it may also have been due to the fact that, from the point of view of performance, the contrast group probably represented a better sample of the population than the patients did.

A total of 32 patients had permanent residual symptoms after the meningoencephalitis at the end of the observation period. These patients did not show a higher rate of abnormal electroencephalograms than the other patients. In an additional 74 patients, who had complained of neurological and mental symptoms which were present at the time of the patients' discharge and which arose in direct connection with the meningoencephalitis, these sequelae were mild and disappeared during the observation period, generally within a few months. Older patients showed sequelae more often than younger patients, and women more often than men. The degree of severity of the meningoencephalitis and the results of the electroencephalographic examination during the acute stage of the disease showed no correlation with the occurrence of the sequelae. Mental symptoms preceding the onset of meningoencephalitis and stressful situations during the period of onset, on the other hand, were found to be of significance in the appearance of mental sequelae.

The prognosis for primary aseptic meningoencephalitis proved to be very good for both children and adults in this series. This is not compatible with the assumption that primary aseptic meningoencephalitis of the type observed in Sweden during the past 20 years is a common or, in any other sense, an important cause of mental illness or behavioral disturbances. Nor does meningoencephalitis of this type appear to be of any great causative significance in epilepsy, narcolepsy, or endocrine disorders.

Fresh Head Injuries: Clinical and Electro-encephalographic Studies on 399 Patients. E. Frantzen, B. Harvald and H. Haugsted. *Acta psychiat. et neurol. scandinav.* (no. 4) 33:417-428, 1958 (In English) [Copenhagen].

The authors report on 257 men and 142 women with head injuries, who were referred to the neurological department of the Frederiksberg Hospital in Copenhagen not later than one week after their admission to the casualty ward of this hospital immediately or shortly after sustaining their injuries. Most of the head injuries were caused by traffic accidents. As might be expected, the symptoms exhibited by motorcyclists and automobile

drivers were considerably severer than those observed in pedestrians and bicyclists. Nine of the 399 patients had intracranial hematomas and were transferred to the department of neurosurgery. Five of the 399 patients died, and 4 of the deaths occurred among patients with intracranial hematomas. The symptoms were severer in men than in women, but the duration of symptoms was longer in women than in men.

Electroencephalograms were obtained from 233 patients on one or more occasions. Normal electroencephalograms were obtained from 157 of the 238 patients; the electroencephalograms of the remaining 81 patients (34%) revealed various abnormalities. The frequency of irritative foci, i. e., foci with spikes, sharp waves, or rhythmic series of slow, high-voltage activity, was considerably higher in children than in adults. All foci in children up to 9 years of age were of occipital localization, while this localization was not observed in any of the patients over 20 years of age; these irritative occipital foci did not show any correlation with the severity of the sustained trauma. Most of the abnormal electroencephalographic findings disappeared within 3 months after the occurrence of the trauma. Electroencephalograms are of some prognostic value; the symptoms persisted for a longer period in patients with severe diffuse abnormalities, but an absolute correlation between the electroencephalographic findings and the clinical manifestations could not be demonstrated.

GYNECOLOGY & OBSTETRICS

Studies to Detect the Escape of Amniotic Fluid into the Maternal Circulation During Parturition. R. A. Sparr and J. A. Pritchard. *Surg. Gynec. & Obst.* 107:560-564 (Nov.) 1958 [Chicago].

The authors present 2 proved cases of amniotic fluid embolism that occurred in Dallas, Texas, during the past 2 years. One of the women died almost immediately after the first sign of distress. In the other, death did not occur until 4¼ hours after the initial evidence of difficulty and defective blood coagulation was demonstrated. The studies described were designed primarily to answer the following questions: 1. Do slight to moderate amounts of amniotic fluid regularly or even occasionally escape into the maternal circulation during labor or delivery without producing clinical evidence of such an escape? 2. Is the detection of any amniotic fluid debris in maternal blood vessels always an indication of a pathological state, or can it represent a normal event regularly associated with labor and delivery? 3. Does the use of Pitocin to initiate and maintain labor enhance the escape of amniotic fluid into the maternal circulation?

The possibility was ascertained whether maternal red blood cells labeled with radioactive sodium chromate ($\text{Na}_2\text{Cr}^{51}\text{O}_4$) and placed in the amniotic sac might prove a satisfactory "tag" to detect any transfer of amniotic fluid into the maternal circulation. Preliminary studies in which red blood cells were added to sterile amniotic fluid in vitro and incubated at 37 C for 24 hours revealed that amniotic fluid was no more than slightly hemolytic. Subsequent studies performed in vivo also yielded only minimal evidence of hemolysis within the amniotic fluid at the end of 24 to 36 hours.

Thirty to 50 ml. of blood drawn from the mother was incubated with 150 to 200 μc of $\text{Na}_2\text{Cr}^{51}\text{O}_4$ in acid-citrate-dextrose solution for 20 to 40 minutes at room temperature with occasional agitation of the flask. The supernatant liquid was removed after centrifuging, and the separation was repeated after resuspending the red blood cells in 3 to 4 times their volume of isotonic sodium chloride solution. After 2 such washings enough saline solution was added to restore or slightly exceed the original volume of blood. At this time 98 to 100% of the radioactivity was bound to the erythrocytes. A carefully measured volume ranging from 20 to 40 ml. of a suspension of red blood cells so labeled and suspended in saline solution and containing about 100 μc of radioactive chromium was introduced transabdominally into the amniotic sac to effect tagging of the amniotic fluid. The patients selected for study either were for repeat cesarean section (13 patients) or were at term, being either in very early labor or suitable for induction of labor (25 patients). From 2 to 24 hours after tagging the amniotic fluid, spontaneous labor with delivery occurred in 13 patients, and labor was induced and maintained with dilute intravenous pitocin solution in 12. Maternal blood specimens were collected before cesarean section or at the start of induction of labor, when the amniotic sac ruptured, at delivery, and every 24 to 48 hours thereafter for 2 to 5 days. It was concluded on the basis of these studies that normally practically no amniotic fluid escapes into the maternal circulation during labor or delivery, that the use of Pitocin to initiate and maintain labor does not especially enhance its escape, and that the finding of any amniotic fluid debris in the maternal lungs is evidence of a pathological process rather than merely an aftermath of normal labor and delivery.

Changes of Breast in Imbalance of Hypophysial-Ovarian Hormones. J. Argons, R. Grienberg, S. Wais and L. Ferreyra Revel. *Rev. Asoc. méd. argent.* 72:245-248 (July) 1958 (In Spanish) [Buenos Aires].

Fifty-five women with endocrine diseases due to an imbalance of the hypophysial-ovarian hormones were observed on the endocrinology ward of the Rivadavia Hospital in Buenos Aires. Thirty-nine

patients had several syndromes due to total ovarian insufficiency, 1 had hypothalamic amenorrhea, and 15 had total insufficiency of the anterior part of the hypophysis. The urinary gonadotropins were increased in total ovarian insufficiency, were normal in hypothalamic amenorrhea, and were diminished in total insufficiency of the anterior part of the hypophysis. In all 55 patients the vaginal cytology indicated a diminution of estrogenic activity. Estrogen therapy was given as follows: Patients with total ovarian insufficiency received diethylstilbestrol dipropionate in daily doses of 1 or 2 mg. for a series of 20 days each; intervals of 10 days were interposed between treatment periods to permit resumption of the menstrual cycle. Before treatment the breast was undeveloped, atrophic, or hypotrophic, with normal areolar and nipple pigmentation and without nipple secretion. After treatment the weight and size of the breast became normal, areolar and nipple pigmentation increased, and nipple secretion did not appear. Patients with total hypophysial insufficiency had intramuscular injections of estradiol benzoate, 50,000 I.U. each, every other day for a total of 90 days. Before treatment the breast was undeveloped or atrophic, with slight areolar and nipple pigmentation and without nipple secretion. No changes in the breast were obtained in these patients from estrogen therapy, but as long as the treatment was continued, the patients reported occurrence of scanty menstruation with hypogastric pain. In hypothalamic amenorrhea, as well as in amenorrhea with galactorrhea, the breast and the areolar and nipple pigmentation were normal before treatment. The breast was unchanged and the areolar and nipple pigmentation increased after treatment in both conditions. The treatment did not affect the absence of nipple secretion in hypothalamic amenorrhea and its presence in amenorrhea with galactorrhea.

Cervicocolpitis (Vaginitis) Emphysematosa. M. R. Abell. *Surg. Gynec. & Obst.* 107:631-638 (Nov.) 1958 [Chicago].

Cervicocolpitis emphysematosa is an unusual but distinctive lesion which is characterized by the presence of small gas-filled spaces in the lamina propria of the vagina and frequently also beneath the squamous mucosa of the cervix uteri. In earlier reports the condition was referred to as "vaginitis emphysematosa," but the author feels that this term is inadequate, because it does not indicate involvement of the uterine cervix which is frequent. The author reviews 8 cases of cervicocolpitis emphysematosa, which were found in the material of the department of pathology of the University Hospital in Ann Arbor, Mich., during a period of 17 years. Four cases were incidental discoveries at autopsy, there being no clinical indication of the

condition. The other cases were diagnosed by biopsies of specimens from the vagina and uterine cervix, which were performed during the investigation of leukorrhea with the purpose of excluding a neoplasm. The ages of the patients ranged from 32 to 67 years, with an average age of 49 years. All patients had been or were married and, with one exception, had had children. Four patients had passed the menopause. None of the other patients was pregnant at the time the diagnoses were made. One woman had an abortion approximately 3 months prior to her death when the autopsy revealed the unsuspected vaginal lesion.

Congestive cardiac failure was a predisposing condition in 4 of the patients, and in 2 other patients there were systemic congestion and hypoxia which were associated with chronic pulmonary disease. The characteristic feature of the disease is the presence of cystic lesions, "gas spaces," in the connective tissue beneath the mucosa of ectocervix and vagina. These gas spaces are presumed to contain air and excite a foreign-body reaction with multinucleated giant cells. Other histological changes include marked congestion of submucosal tissues, exfoliative hyperplasia of squamous mucosa, and chronic inflammation. There is no evidence that the condition is due to any specific infective organism. The lesions appear to form quickly, disappear just as readily, and do not tend to recur except possibly during pregnancy. The observation of 8 cases during a period of 17 years indicates that the condition is not as rare as reports in the English literature would suggest.

A Case of Birth of a Healthy Baby to a Mother During the Incubation Period of Rabies. V. K. Viazhevich. J. Microbiol. (Translation from the Russian) 28:1022-1023 (No. 7-8) 1957 [New York].

The author reports on a 21-year-old pregnant woman living in a neighborhood in which rabies frequently occurred among animals. She possessed a 2-month-old puppy that had lived in the house since its birth. The animal frequently licked and nibbled the woman's hands. Then its behavior changed, and rabies was suspected. On being killed in December, 1953, Negri bodies were found in its brain. Unfortunately the woman did not inform her physician about these events. Shortly afterwards she was delivered of a healthy baby at a maternity home and was discharged in a satisfactory condition on Dec. 23, 1953. Seven days later when signs of infection with rabies occurred, she was admitted to a hospital and died there on Jan. 21, 1954. The diagnosis of rabies was confirmed by microscopic examination. The child was kept under observation for 2 years and 8 months; it remained healthy. These findings indicate that the rabies virus cannot penetrate the placenta during the incubation period.

PEDIATRICS

The Effect of Epidemic Parotitis and Prednisone on Lipid Nephrosis. M. Wijffels. *Maandschr. kindergeneesk.* 26:299-310 (Sept.) 1958 (In Dutch) [Leiden, The Netherlands].

The author describes observations on a 6-year-old boy in whom a diagnosis of lipid nephrosis was established. After commenting on the pathologic-anatomic basis of lipid nephrosis and on its pathological physiology, he discusses the clinical course and the treatment. In the boy whose history is presented, it was found that an attack of mumps (epidemic parotitis) had the same therapeutic effect on the lipid nephrosis as had treatment with prednisone. Complete remissions were obtained 3 times in succession with prednisone therapy. The moment the therapy was stopped the lipid nephrosis recurred. A small maintenance dose was sufficient to sustain the remission obtained.

Obstructive Factors in the Pulmonary Hyaline Membrane Syndrome in Asphyxia of the Newborn. J. M. Craig, K. Fenton and D. Gitlin. *Pediatrics* 22:847-856 (Nov.) 1958 [Springfield, Ill.].

The authors describe experiments which aimed at defining the role of the pulmonary hyaline membrane in the respiratory distress of newborn infants with the hyaline membrane syndrome. Lungs were obtained from 3 groups: (1) infants without evidence of respiratory distress, including full-term and premature infants dying of erythroblastosis and massive aspiration of gastric contents; (2) a full-term stillborn infant with severe hydrocephalus; and (3) premature infants with histories of post-natal asphyxia typical of the hyaline membrane syndrome. The 8 infants in the latter group lived from 3 hours to 2 days. In all instances the lungs of one side were used for injection studies, while sections of the contralateral uninjected lungs were obtained to confirm the presence or absence of the hyaline membranes. Three types of masses were injected into the lungs: (1) a gelatin-India ink compound; (2) a latex, ammonia, and water mixture; and (3) solutions of various concentrations of plasmin.

The study of serial sections, reconstructions, and latex casts from infants with severe atelectasis with hyaline membrane formation left little doubt that such lungs have a markedly different pattern of expansion under controlled conditions than lungs of infants without evidence of intrinsic pulmonary pathology. The demonstration that such membranes line all the expanded air-containing spaces beyond the epithelium-lined bronchi and that such membranes block the effective passage of gelatin-India ink mixtures into more distal alveoli are quite in keeping with the reconstructed figures and latex casts. It would appear that the membranes

must act in part as a definite barrier to the ventilation of the more peripheral alveoli, as well as interfere with diffusion of oxygen and carbon dioxide within the air-containing proximal alveoli which still communicate freely with the bronchi.

The introduction of plasmin into the lung caused dissolution of the hyaline membranes. The authors feel that this has theoretical as well as practical importance. Plasmin is a fibrinolysin which is obtained by activation of plasminogen by streptokinase, the former being a component of human plasma. Plasmin has been shown to be effective in vitro and in vivo in lysing fibrin clots, and appears to be innocuous to normal tissues, having been used intravascularly, in sinus tracts, and in open wounds. The authors had demonstrated previously that the mass of the material in the hyaline membrane was fibrin; the dissolution of such membranes by plasmin is consistent with that observation. The introduction of plasmin in high concentration into the trachea of an infant with the hyaline membrane syndrome may possibly prove an effective method of therapy.

Serious Complications of Chickenpox. F. Kuipers and J. van der Mei. *Maandschr. kindergeneesk.* 26:294-298 (Sept.) 1958 (In Dutch) [Leiden, The Netherlands].

Chickenpox is generally a relatively harmless disease. Complications are rare, and, when they do occur, they are usually the result of secondary infection with hemolytic streptococci. In recent years primary chickenpox pneumonia has been observed chiefly in adults. It is not known what factor or combination of factors is responsible for the fact that the varicella infection is usually limited to the skin. A number of recent reports indicate that in patients who are being treated with adrenal steroids for other disorders the feared generalization of an intercurrent chickenpox infection is often observed. In this connection the authors mention 2 children formerly treated at their clinic. One had received cortisone in daily doses of 12.5 to 100 mg. in the treatment of aplastic anemia with thrombocytopenia and had recently received a maintenance dose of 5 mg. of prednisone per day. This child died 3 days after the eruption of the exanthem as the result of hemorrhagic chickenpox. The second child, who had an acquired hemolytic anemia, had been treated for years with a daily maintenance dose of cortisone, from 10 to 25 mg., and had recently been given prednisone, at first 20 and then 10 mg. per day. When chickenpox developed, his general condition rapidly declined, and he died of bronchopneumonia 6 days after the onset of the chickenpox. In 2 older children who received prednisone for idiopathic thrombocytopenic purpura and rheumatoid arthritis, respectively, intercurrent chickenpox infection was without serious

complications after they had received convalescent serum and the dose of prednisone had been reduced to a maintenance level.

Patent Ductus Arteriosus: A Clinical and Hemodynamic Study of 23 Patients in the First Year of Life. A. M. Rudolph, F. E. Mayer, A. S. Nadas and R. E. Gross. *Pediatrics* 22:892-904 (Nov.) 1958 [Springfield, Ill.].

The authors describe the clinical findings, hemodynamic data, and results of treatment in 23 infants with patent ductus arteriosus, who ranged in age between 6 days and 1 year. The differentiation by clinical means of patent ductus arteriosus from other cardiac lesions with left-to-right shunts (ventricular septal defect, endocardial cushion defect) is frequently very difficult in young infants. Because of the frequency of severe symptoms in infancy and their dramatic response to surgery, recognition of the entity assumes great importance. It is suggested that the diagnosis be considered in any infant with clinical evidence of a large left-to-right shunt. Cardiac catheterization proved to be a useful and reliable method for establishing the diagnosis and for providing detailed hemodynamic observations. Catheterization caused no complications in this group. In most instances the catheter can traverse the ductus and can be passed into the descending aorta. It is important to distinguish between passage of the catheter from pulmonary artery to aorta and passage from right ventricle through a ventricular septal defect to aorta. Pressures recorded during slow withdrawal of the catheter demonstrate a step-wise change from aorta, through the ductus, to pulmonary artery.

The authors give particular attention to arterial oxygen unsaturation, which was present in over half of the patients. The finding of unsaturated femoral arterial blood suggested the presence of a right-to-left shunt through the ductus. However, in 5 patients with arterial unsaturation, from whom simultaneous right axillary and femoral arterial blood samples were obtained, only one showed a higher saturation in the axillary artery. The mechanism of the arterial unsaturation required explanation, and the authors discuss it in its relation to pulmonary disease and right-to-left shunting of blood. A large atrial left-to-right shunt may occur through a dilated foramen ovale in infants with patent ductus arteriosus. Pulmonary arterial hypertension of mild to severe degree was present in the majority of the patients, but pulmonary vascular resistance was elevated in only 5.

Surgical division of the ductus was performed in 21 of the 23 patients shortly after establishing the diagnosis. One infant died 3 days after operation with severe respiratory distress and was found at autopsy to have acute bronchopneumonia, chronic mastoiditis, hypoplastic kidneys, and con-

genital absence of the spleen. Another infant died 3 months after surgery, and the circumstances of death are unknown. A third patient died 18 months after surgery of progressive pulmonary vascular disease. Otherwise the results have been gratifying. Of the 18 patients who survived, only 9 have been followed for more than a year since operation. Three of them still have symptoms, but these have associated lesions.

Bronchopulmonary Sequestration in Infancy and Childhood. C. L. Warner, R. L. Britt and H. D. Riley Jr. *J. Pediat.* 53:521-528 (Nov.) 1958 [St. Louis].

Bronchopulmonary sequestration is usually considered to be the association of an anomalous artery with a dissociated or sequestered bronchopulmonary mass. Two cases, one intralobar and the other extralobar in type, occurring in children are reported; the latter was associated with congenital absence of the pericardium. Both patients were cured by surgical extirpation of the involved segment. It is generally agreed that bronchopulmonary sequestration is of congenital origin. Prevailing theories concerning development of the anomaly have been grouped into 4 categories—mechanical, traction, vascular insufficiency, and idiopathic. The hypothesis that has received most favor is that of vascular traction, suggested by Pryce. This theory considers the primary fault to be in the development of an abnormally located artery and the associated pulmonary anomaly to be a complication or secondary effect. Regardless of the exact mechanism, the sequence of events is most likely to occur in the region of the primitive diaphragm. The aberrant arteries most frequently arise from the lower thoracic or upper abdominal aorta and commonly traverse the inferior pulmonary ligament. Pryce found that the anomalous arteries, although of systemic origin, frequently resembled pulmonary arteries in that their walls were more elastic than muscular. Some were found to appear systemic on the aortic side and pulmonic on the lung side. In any event, such arteries subject to systemic-arterial pressure often exhibit atheromatous degeneration.

The following significant differences between extralobar and intralobar sequestration have been pointed out by Pryce: 1. Extralobar sequestration shows a marked left-sided preponderance, only 3 of 40 cases having occurred on the right side. 2. Venous drainage from an extralobar sequestrum frequently is to the hemiazygos vein, with that from an intralobar sequestrum usually to the pulmonary vein. 3. Extralobar sequestration commonly is associated with a diaphragmatic hernia. This has not been noted with intralobar pulmonary sequestration. The left preponderance of extralobar sequestration suggests a later embryonic origin when the

expanding pleural sacs envelop the pericardium. The absence of the left mediastinal pleura and pericardium associated with the pulmonary ectopia in the second of the 2 reported cases provides evidence to support this. In extralobar sequestration the lesion is anatomically separated from the adjacent lung, although otherwise the gross and microscopic pathology is similar to that of intralobar sequestrums. Extralobar sequestrums apparently are seldom infected. In intralobar sequestration recurrent infection is the rule. Antibiotic therapy produces only temporary remission from symptoms, and infection invariably recurs. Bronchoscopic aspiration and postural drainage are of little or no avail. Definitive treatment is surgical and consists of extirpation of the diseased tissue. In extralobar sequestration the lesion may be excised without disturbing the adjacent normal lung; in intralobar pulmonary sequestration lobectomy is indicated.

Genuine Hydronephrosis in Children: Clinic, Treatment and Results of Treatment. J. Lund. *Ugesk. læger* 120:1385-1389 (Oct. 16) 1958 (In Danish) [Copenhagen].

Twelve cases of genuine hydronephrosis in children are reported, 10 of which were treated by conservative intervention, with good results, both as to function and as to disappearance of the symptoms after plastic operation. Follow-up for from 1 to 5 years showed completely good results in 7 cases; 1 child is subjectively free from symptoms, with sterile urine, but the hydronephrosis has not disappeared; and 2 patients are improved but have at times had infection of the urinary tract. The treatment of hydronephrosis in children should to a far greater degree than in adults be operative to improve or to preserve the renal function. Conservative treatment gives the prospect of good results and can be carried out in almost 90% of the cases. Early recognition of the hydronephrosis is important. Roentgen diagnosis, i. e., urography, is decisive and is called for in all children with recurring abdominal colic and in all children with "chronic appendicitis." In treatment of hydronephrosis in children nephrectomy should be undertaken only when there is no renal tissue left.

Severe Generalized Disease (Encephalohepatomyocarditis) Occurring in the Newborn Period and Due to Infection with Coxsackie Virus, Group B: Evidence of Intrauterine Infection with This Agent. S. Kibrick and K. Benirschke. *Pediatrics* 22:857-875 (Nov.) 1958 [Springfield, Ill.].

Recent reports indicate that infection with Coxsackie viruses of group B during the neonatal period may result in a severe and frequently fatal disease, characterized primarily by myocarditis and/or meningoencephalitis but also with involvement of other organs. The authors report 2 addi-

tional cases of infection with Cocksackie virus, group B, type 4, both with fatal termination. In the first, the virus was present in the myocardium in high titer and was isolated as well from the feces of 2 siblings. In the second, in which infection was incurred in utero, the agent was recovered from the myocardium, spinal cord, and liver of the infant as well as from the feces of the mother. The clinical histories, along with pertinent pathological and virologic findings, are described, and their significance is considered.

During the past few years at least 25 cases of this disorder have been recognized. Of the 25 infants, 3 and 10, respectively, were involved in 2 nursery outbreaks in South Africa. Cocksackie virus, group B, type 4, was recovered from the feces of 2 of the 3 children in the smaller outbreak. In the larger outbreak, brain tissue from 2 infants and the feces of a 3rd produced changes in suckling mice consistent with group B Cocksackie infection, and a Cocksackie virus, group B, type 3, was isolated from the feces of a 4th. The remaining 12 infants represented sporadic cases of this disorder in which the diagnosis was established by isolation of the virus at autopsy. The clinical and pathological findings on these patients are tabulated.

Dehydroepiandrosterone in Treatment of Mongolism. J. de Moragas. *Rev. españ. pediat.* 14:545-552 (July-Aug.) 1958 (In Spanish) [Saragossa].

Mongolism is a syndrome of morphologic abnormalities of embryonal origin. It can be mitigated by early proper treatment but becomes more marked in untreated patients. Suprarenal cortical insufficiency is an important factor in its pathogenesis. Correcting the insufficiency improves the mongoloid facies and relieves other symptoms. This was found by chance in a baby with mongolism who was being treated with desoxycorticosterone acetate (DOCA) for a different illness. Later DOCA was used with equally good results in some other infants with mongolism. The author has used dehydroepiandrosterone (DEA) in treating 61 out of a series of 163 children with mongolism during the last 5 years. The initial treatment consisted of two periods of intramuscular injections. During the first, the DEA was given intramuscularly in daily doses of 50 mg. for several weeks; during the second, the same dose was given thrice weekly for a long period. The subsequent maintenance treatment consisted of alternating 10-day periods of medication and rest. During the treatment periods the patient took dragées of 10 mg. each, 4 or 6 being given daily by mouth as an equivalent dose of 40 to 60 mg. The earlier the treatment is started, the better the results. In the group of patients treated by the author, 38 were infants less than 2 months old and 23 children were over 3 years of age when the treatment was started. The infants lagged about 3 to 8 weeks

behind normal in motor capacity. Thirty-two infants who reached the age of 2 years in the course of the treatment were able to walk at an average age of 19 months, in comparison to ages of 2 or 3 years for walking in infants who had no treatment. The mongoloid features became greatly attenuated in 32 infants, 30 of whom exhibited improved facial expression, good response to stimulation, and a syntonic personality. The benefits obtained from the treatment in the older children were not as remarkable as they were in the infants. The mongolian facies became progressively attenuated in 15 out of the 23 children, blepharitis disappeared in 18, and cryptorchism in 7 out of 8 cases. All the patients became more teachable.

The author concludes that the drug is the most effective one yet found for mongolism. It is well tolerated and it can be given to ambulant patients. It has no effect on the development of talking. The treatment does not transform the mongoloid into a normal child, but it greatly improves the somatic and mental conditions of the patients, makes the mongoloid features less noticeable, and favors permanent adaptation of the patient to social and familial relations.

A representative case is reported as follows: The patient was observed for the first time when he was 2 weeks old. He was born 15 days before full term to a secondipara. The mongolism syndrome was very marked. The baby had a hernia at the linea alba. By the end of the first week of treatment, the general health condition of the patient had greatly improved. It was still better by the end of 2 months and 11 months of treatment. When the infant reached the age of 11 months the mongoloid facies had greatly improved and all the associated symptoms and the hernia had disappeared. At the age of 14 months the infant showed improved mental reactions. He responded to stimulation, recalled the answers given by other persons, and could sit still. The mongolian facies was replaced by an expression of alertness. Pictures of the infant at different ages and different stages of mongolism are presented.

The Relation Between Body Weight and Dosage of Insulin in Juvenile Diabetes Mellitus. B. Zachau-Christiansen. *Danish M. Bull.* 5:228-233 (Oct.) 1958 [Copenhagen].

The author reports on 80 children, 41 boys and 39 girls, with diabetes mellitus. The disease developed in 47 children before they had reached the age of 6 years and in 28 during the next 5 years; only 5 children were over the age of 10 years at the onset of the disease. By repeated admissions to hospital and outpatient control in the pediatric departments of 2 hospitals, it was possible to follow the patients until the age of 15 years for average periods of 7 and 5.4 years, respectively, in early and late cases. Regular records were avail-

able as regards the requirement of insulin at each consultation, and the patients were, as a rule, weighed at that time. Until puberty, normal weights and possibly some retardation in height were observed. At puberty, retardation in weight, which was most pronounced in girls, was found. The rather considerable glycosuria, which was permitted, may have been responsible for these observations. By analysis of the variances it was shown that the relative requirement of insulin was constant, irrespective of sex, age, and duration of the disease and apparently irrespective of the type of insulin employed. The average quotient (insulin dosage in international units by weight in kilograms) and the standard deviation were 1.1 ± 0.4 I. U. per kilogram of body weight. The curve for absolute insulin requirement followed the weight curve closely.

DERMATOLOGY

"Chrome" Dermatitis: A Study of the Chemistry of Shoe Leather with Particular Reference to Basic Chromic Sulfate. G. E. Morris. A. M. A. Arch. Dermat. 78:612-618 (Nov.) 1958 [Chicago].

In his attempt to elicit the cause of an eruption of the feet, the physician has been guided for years by certain accepted dictums: (1) the chromium which is used in tanning most hides into shoe leather cannot cause such eruptions, inasmuch as it is not "hexavalent," and "only 'hexavalent' chromium can cause skin disease" and (2) this chromium is firmly fixed in the leather. The author points out that both of these "principles" are incorrect and that, therefore, if a person sensitive to certain chromic salts is afflicted with recurrent "shoe leather dermatitis," the cause may well be the chromium in his shoes. During the past year his research into this subject has demonstrated that the "hexavalent" theory is entirely unfounded. The leather chemists have recently established that the perspiration of certain persons can solubilize the chrome of their shoes and cause it to migrate within the fibers of the leather.

The author discusses the manufacture of leather, chrome tanning, and the clinical aspects of shoe leather dermatitis. He shows that chrome salts can be leached from shoe leather by the lactic acid and lactate portion of human perspiration. This chrome can thus be deposited on the skin. The particular chromium salt involved is a trivalent basic chromic compound of complex nature: basic chromic sulfate— $[\text{Cr}(\text{H}_2\text{O})_5\text{OH}]\text{SO}_4$. It has lately been made available to the medical profession for patch testing, as has also a chromic lactate complex containing 2 lactate ions per atom of trivalent chromium.

Four patients with shoe leather dermatitis are reported as having positive patch tests to 0.2% basic chromic sulfate. Two leather workers who pre-

viously had "chrome dermatitis" also had positive tests to this compound. A 7th patient had a positive test to sodium dichromate but a negative test to basic chromic sulfate. This is the first report of positive patch tests to a trivalent chromium compound. The basic chromic sulfate leached by perspiration from shoes and deposited on the skin can cause sensitization dermatitis. Other physicians have tested people for dermatitis due to dyes and to other chemicals, to rubber adhesives, or to thermoplastic materials found in shoes, but no one has previously tested them with basic chromic sulfate.

Subcorneal Pustular Dermatoses. F. A. Ellis. A. M. A. Arch. Dermat. 78:580-588 (Nov.) 1958 [Chicago].

The author points out that in 1956 Sneddon and Wilkinson described 6 patients who had a bullous dermatitis which resembled dermatitis herpetiformis in many of its clinical features but which was characterized by the presence of subcorneal pustular vesicles. They believed that these patients had a distinct and new syndrome and used the name "subcorneal pustular dermatosis." During the past 4 years 3 instances of atypical dermatitis herpetiformis were encountered in the Johns Hopkins Hospital in Baltimore. In light of the study of Sneddon and Wilkinson, these cases were reviewed and, because of the clinical similarities to dermatitis herpetiformis and the histological presence of a subcorneal blister, they are considered to be similar to the cases of the English authors. Data on 14 cases which present similar clinical and histological manifestations are available for study. These include the 6 cases of Sneddon and Wilkinson, 1 case each reported by Hellier, Carney, Cipollaro, Burgoon and associates, and Greenbaum and Lee, and 3 cases in the present report. When these cases are considered together, the clinical picture remains remarkably like that described by Sneddon and Wilkinson.

The disorder is encountered primarily in women over 40 years of age. It is characterized by superficial vesicopustules which form annular or gyrate plaques with irregular spreading borders. The lesions are located primarily on the torso and upper parts of the extremities and involve the intertriginous areas about the breasts, axillas, and groin. The lesions involute to form thin superficial crusts, followed by residual hyperpigmentation without atrophy; they recur in overlapping waves of healing and persist over a number of years; they ordinarily will not respond to the use of local and systemic antibiotics, but, in general, response is achieved after therapy with sulfapyridine or one of the sulfones. The histological features include a subcorneal vesicle, varying in size from 0.1 mm. to several millimeters in diameter, covered by a

thin keratin layer with the base formed by the granular layer, containing a thin layer of frankly purulent material consisting of serum, leukocytes, and leukocytic debris, and containing an occasional acantholytic cell in the base of the blister. The rete may be normal or slightly acanthotic and show minimal edema and exocytosis. The papillary and subpapillary layers may be involved with slight edema and a very mild round-cell infiltrate. Bacteria were not seen in the skin sections.

Subcorneal Pustular Dermatitis: Report of a Case. R. J. Schoenfeld. *A. M. A. Arch. Dermat.* 78:589-591 (Nov.) 1958 [Chicago].

The patient with subcorneal pustular dermatosis presented in this paper was observed recently at the Receiving Hospital of the City of Detroit. A 63-year-old Negro woman was admitted for treatment of a generalized pustular, scaling, pruritic eruption of 5 days' duration, accompanied by moderate malaise. She had experienced several similar episodes of generalized dermatitis during the 6 months prior to admission. During earlier episodes these acute generalized exacerbations would last 10 to 14 days and then subside to a chronic pruritic vesicular and scaling eruption of the extremities with resulting hyperpigmentation. She had been seen 13 and 10 years previously regarding this same skin disease which had had its onset 20 years ago. While the clinical picture of this patient differed somewhat from that described by Sneddon and Wilkinson, the histology did not. The tense vesicles which were thought to be subepidermal were found to be subcorneal. The response to sulfapyridine therapy was similar to that in the previously described cases. Clinically, this case and one other recently observed presented superficial vesicles and bullae filled with a turbid fluid, which proceeded to superficial scaling. It is suggested that, until more of these cases can be studied, they be considered as a separate entity under the name given by Sneddon and Wilkinson, "subcorneal pustular dermatosis."

UROLOGY

Cobalt Therapy: III. Treatment of Neoplasms of the Urinary Bladder. W. J. Taylor, T. Carlile, J. H. Walker and others. *Bull. Mason Clin.* 12:124-133 (Sept.) 1958 [Seattle].

The authors list various radioactive sources that are available for the treatment of vesical cancer and report their own experiences with the radio cobalt (Co^{60}) rotation therapy unit available at the Mason Clinic in Seattle. When this unit is used, the bladder and other vital structures are localized by contour and pelvimetric procedures. The center of rotation and port size are selected on the basis

of the extent of the lesion and the geometric arrangement of tissues in the area of therapy. The Co^{60} source is rotated in an incomplete arc, sparing a posterior wedge of tissue which minimizes the exposure of rectal and other posterior tissues. The dose level varies up to approximately 5,500 r of gamma radiation to the depth of the bladder tumor, depending on whether the effort is palliative or curative. Occasionally a stationary treatment technique is used. Urinalysis is done each week for evidence of infection. The patient voids before each treatment.

Since the installation of the Co^{60} rotation therapy unit, courses of treatment have been completed in 19 patients with malignant neoplasms of the urinary bladder. Radical treatment intended for cure was given to 14 patients and palliative treatment to 5. Of the 14 patients who received curative treatment, 11 are still living and 3 have died. Of the 11 survivors, 7 are free from tumor from 3 to 13 months after treatment, 2 have tumor 9 months after treatment, and the remaining 2 have not been examined since the completion of treatment 2 months previously. Of the 5 patients receiving palliative treatment, 3 are surviving from 1 to 8 months after treatment and 2 have died 4 and 6 months, respectively, after treatment. The authors resort to radical or palliative Co^{60} teletherapy as follows: (1) in some patients with superficial tumors whose lesions are inoperable on account of medical conditions; (2) in high-grade superficial lesions, even without evidence of extension; (3) in patients with evidence of residual tumor after resection; (4) in carefully evaluated patients with recurrent multiple low-grade lesions; (5) in patients with tumors demonstrating deep muscle wall or perivesical fat extension; and (6) in some patients with local metastasis, if they are in a satisfactory condition.

Urolithiasis in Poliomyelitic Patients. S. G. Doll, R. T. Bergman and J. E. Affeldt. *J. Urol.* 80:371-373 (Nov.) 1958 [Baltimore].

Immobilization of patients is known to increase the incidence of urolithiasis regardless of other etiological factors. Urolithiasis is rather frequent in patients with poliomyelitis; with continuing advances in the treatment of the latter disease more patients survive, and the problem of urinary stone formation is likely to increase. Programs for the prevention of urolithiasis include diet restrictions, mobilization, administration of hyaluronidase, salicylamide therapy, and increasing fluid intake. The authors established a base-line stone incidence from which they could draw conclusions once a stone prophylaxis program was initiated. This report is concerned with the patients seen at the respiratory center for poliomyelitis, Rancho Los Amigos Hospital, Downey, Calif., from Jan. 1, 1952, to Jan. 1,

1956. Seven hundred ninety-seven patients were admitted. Roentgenograms of the abdomen to include kidneys, ureters, and bladder were taken in 675 of these patients shortly after admission and were repeated as symptomatology or urinalysis suggested urinary tract disease. The time of onset of stone formation cannot be stated in most cases, because, except for the routine roentgenogram on admission, roentgenographic examinations were not repeated at definite intervals, but only when symptoms suggested the possibility of stones.

Urolithiasis developed in 101 patients (15%), in 48 males and 53 females. Since the group studied included 354 males and 321 females, the incidence of urolithiasis in females was slightly higher than in males (16.5% compared with 13.6%). There was a more notable difference in stone formation between younger and older poliomyelitic patients. Whereas in the patients less than 10 years old the incidence was only 5.8%, it rose to 34.8% in those between 40 and 49 years of age. A decreasing incidence of stone formation by year was noted, although no definite program of stone prophylaxis was instituted. Since the incidence of urolithiasis dropped, despite the absence of special prophylactic measures, the authors feel that it might be well to consider the merits of any special program that has features which patients resent or hesitantly follow. This is particularly true of the severely paralyzed patient whose disease already imposes restrictions. The shifting stone incidence from year to year is confusing, and the answer is unknown. The etiology of urolithiasis is still not completely clear, and more needs to be done before the merits of any stone prophylaxis program can be given credit.

Use and Abuse of Urethral Catheters. C. D. Creevy. *Northwest Med.* 57:1427-1432 (Nov.) 1958 [Seattle].

According to Creevy, one may fulfill all of the needs of an active urologic practice with 5 kinds of urethral catheters. These include the red rubber or latex Robinson type, with a hollow tip and 2 or more eyes near the vesical end; the rubber Thieman catheter, with an angulated olive tip; the Phillips woven fiber instrument, with a conical tip terminating in a male screw for attachment to a filiform bougie; the well-known Foley catheter and Alcock's modification thereof, with 2 lumens. The Foley catheter has 2 advantages over all the other types for continuous drainage: inflation of the balloon retains the catheter in place without adhesive, and it permits escape of the urethral secretions invariably provoked by the long-continued presence of a foreign body. Stylets are intended to guide the catheter through the curved and sensitive urethra, not to enable one to push through the substance of the prostate or the wall of the urethra. The use of force with urethral instruments is al-

ways a mistake. While one ordinarily dips the tip of a catheter in a water-soluble lubricating jelly, it is often helpful to inject 5 cc. of lubricating jelly into the urethra with the aid of a urethral syringe, the tip of which is longer and broader than that of the ordinary Luer syringe; it fills the external meatus so that the lubricant goes into rather than around. Another useful accessory is the bedside irrigator which, used with a Foley-Alcock catheter, permits continuous irrigation, particularly after transurethral resection; it may be a helpful temporary measure during bleeding of spontaneous origin.

The use of the catheter is indispensable for the measurement of residual urine, especially in the patient with a normal feeling prostate and increased frequency of urination in the absence of pyuria. Its use for the relief of acute urinary retention and for the location of strictures of the urethra is obvious. Clots may be evacuated from the bladder by the judicious employment of the catheter, although a larger than normal size will be required. Perhaps the commonest indication for use of the inlying catheter is the presence of chronic incomplete urinary retention due to prostatism and complicated by impaired renal function owing to "back pressure" or by an acute febrile infection. Another but less well-known use of the catheter is the rapid dilatation of urethral strictures when this is desirable to permit drainage of the distended bladder or cystoscopy. Lastly, the catheter may be used to achieve cleanliness in irreparable urinary incontinence in the female. If repeated instrumentation is necessary, or if an inlying catheter is used, it is desirable to administer an antibiotic with a fairly wide spectrum, avoiding those which are known to produce reactions frequently, particularly if a long period of treatment is expected. Acetyl sulfisoxazole (Gantrisin) and the triple sulfonamides are to be preferred for ordinary use; the most potent agents are reserved for complications. When inlying catheters are used for long periods, they are best changed every 5 to 7 days to prevent plugging by encrustations of urinary salts, mucus, or thick pus.

OPHTHALMOLOGY

The Decline in Aqueous Secretion and Outflow Facility with Age. B. Becker. *Am. J. Ophth.* 46:731-736 (Nov.) 1958 [Chicago].

The author reviews a large number of tonograms and observations on a series of perfused enucleated eyes in order to evaluate the variations of facility of outflow and rate of aqueous secretion with age. Tonograms on a total of 909 normal eyes were analyzed, the patients being divided into 3 age groups: (1) those 40 years of age or less; (2) those

between 41 and 60; and (3) those over 60 years of age. Tonograms of 910 eyes with proved chronic simple glaucoma were likewise analyzed. At the time of tonography all these eyes had not been operated on. Although the patients were not receiving secretory suppressants, most of them were on miotic therapy. A series of 54 enucleated normal eyes were perfused.

Summarizing the results of these studies, the author says that in normal eyes tonography reveals a significant progressive decrease in average outflow facility with age, from an average of 0.33 for eyes of those 40 years of age or under to 0.23 for those over 60 years. This is associated with a significant sharp decline in average rate of aqueous secretion after the age of 60 years. Intraocular pressure is, therefore, maintained reasonably constant at all ages. Perfusion measurements, as well as fluorescein turnover studies, confirm the increasing resistance to outflow with age in normal eyes. Eyes with chronic simple glaucoma also demonstrate a significant decrease in secretory rate with advancing age. This hyposecretion may prevent pressure damage in spite of the outflow disorder. Intraocular pressures over 20 mm. Hg occur in only 7% of normal eyes, and, therefore, a scale reading of 4.0 with the 5.5-Gm. weight suggests careful evaluation for glaucoma.

The Treatment of Retinoblastoma by X-Ray and Triethylene Melamine. A. B. Reese, G. A. Hyman, N. duV. Tapley and A. W. Forrest. A. M. A. Arch. Opth. 60:897-906 (Nov.) 1958 [Chicago].

In 1953 the authors began to treat retinoblastoma with a roentgen-ray tumor dose reduced to 3,250 r in combination with triethylene melamine (TEM) administered orally. In 1955 they reported on 20 eyes treated by this method. Fourteen of these 20 patients were cured up to that date. These eyes still show complete tumor arrest, and the authors believe that they can now be regarded as cured. When a parenterally given preparation of TEM became available, the authors discarded the oral form of administration, because emesis and irregularity of absorption interfered with the accuracy of dosage. They used a roentgen-ray dose of 3,250 r in combination with an intramuscular injection of TEM in 19 eyes with retinoblastoma. To date 17 of the 19 tumors appear arrested. Of the 2 failures, 1 patient could not be given further TEM for 4½ months after the first intramuscular injection because of bone marrow depression. This patient then received the TEM intra-arterially, and the tumor seemed arrested. The same happened in the second patient after the intra-arterial administration of TEM.

When TEM is administered intra-arterially, it is instilled under direct observation into the internal carotid artery on the side of the involved eye. The

level of the chemotherapeutic agent reaching a localized tumor via the regional arterial supply can be many times greater than that given orally or intramuscularly. The authors resort to the intra-arterial administration of TEM particularly in desperate cases. They recommend this mode of treatment (1) in patients with multiple lesions; (2) in those with tumor seeds in the vitreous; (3) in those unsuccessfully treated by other methods; (4) when residual retinoblastoma is discovered in the optic nerve after enucleation; (5) when residual tumor is discovered in the orbital tissue; (6) in patients with recurrent orbital growth after enucleation; and (7) in patients having received various combinations of treatment elsewhere. The authors have administered 61 intracarotid injections in 31 children belonging to the above categories. The advanced intraocular lesions for which in the past enucleation would have been advised show arrested growth to date in 60% of the cases with administration of TEM by way of the carotid artery. It is too early and too optimistic to claim or expect a cure in all of these.

Radiation alone may cure retinoblastoma but, so far as the authors know, TEM alone does not. The 2 seem to be synergistic or supplementary. That the addition of TEM is effective was evidenced in a series of 12 eyes, 6 of which were treated with roentgen-ray irradiation and 6 with irradiation plus TEM. Three of the 6 eyes treated by irradiation alone showed active growth, while in all of those treated by irradiation plus TEM the tumor growth was arrested. In the future the authors intend to use betatron therapy (it has been employed in more recent cases) in combination with the intra-arterial administration of TEM or some better drug.

Herpes Zoster Ophthalmicus in Children. S. M. Tucker. Arch. Dis. Childhood 33:437-439 (Oct.) 1958 [London].

The author presents the history of a 6-year-old boy, whose illness began 4 days before admission to hospital when his main complaints were abdominal pain and headache. Three days before admission he began to complain of pain over his left eye associated with mild photophobia. For the following 3 days his temperature ranged between 99 and 100 F (37.2 and 37.7 C); he vomited several times and still complained of abdominal pain and headache. The pain over his left eye had now become more acute. Daily examination did not reveal any rash, but on the 4th day in hospital a mild conjunctivitis of the left eye was noted, with some erythema around the eye. A classical cutaneous zoster affecting the ophthalmic branch of the left trigeminal nerve was observed; it included the nasociliary branch on the left side. The vesicles extended only to the midline and involved the left side of the forehead, both upper and lower eyelids, the left

eyebrow, and the root of the nose on the left, together with the bridge and the tip. Many of the vesicles had broken down. The left eye was now inflamed and swollen, and the upper lid overrode the lower as the eye became closed. Conjunctivitis and iritis were also present. The pupil was inactive, but the fundi and disks were normal. On the following day the herpetic dermatitis had become infected, and keratitis was noted; the latter condition was still present 18 days later. The eye had become whiter, and the pupil was still not fully dilated. The corneal ulcers were no longer stainable with fluorescein, but characteristic deep white spots were seen in the corneal stroma. Photophobia remained intense. Four days later the eye was a little improved, the pupil was wider, and there were extensive central nebulas. No corneal sensation was detected. The chemosis and swelling had by this time completely resolved, but the herpetiform scars were still evident. About 5 weeks later the cornea showed a ground-glass appearance, with a few deep residual corneal spots. One month later this had cleared, and the corneal haze was noted to be gradually disappearing. About one year after the initial infection, the patient was found to have supraorbital scarring, normal hair growth of the left forehead, and an eccentric left pupil. Vision had now improved to 6/9. Sensation in the left eye had returned to normal.

A great deal of evidence has accumulated linking the virus of herpes with that of chickenpox. Minor antigenic differences may be present, but the 2 viruses appear to be very closely related. They may differ perhaps in mode of attack: in herpes zoster spread is by the lymphatics, whereas in chickenpox it is usually by the blood stream. There remains the possibility of the occurrence of 2 forms of epidemic herpes zoster, one allied to chickenpox and one allied to herpes. Most evidence, however, supports the monistic theory that zoster and chickenpox are different manifestations of infection by the same virus, zoster being usually a reawakening of the latent infection of chickenpox. Herpes zoster ophthalmicus usually follows a mild course in children, and it is the rule that all traces of the infection clear up with little residual damage. The reported case differs from general observations in some essential points: The child was extremely ill; loss of hair in the ophthalmic division was very noticeable; normal vision had not completely returned one year after the original illness.

Ocular Sarcoidosis: Report of 5 Cases with Fundus Changes. E. Bruntse. *Danish M. Bull.* 5:217-227 (Oct.) 1958 (In English) [Copenhagen].

Sarcoid infiltration was demonstrated histologically in the conjunctiva, sclera, uvea, retina, and optic nerve. Sarcoid granulomas may also develop in the cornea. Sarcoid infiltration of the eye may

lead to exudative reactions, but histopathologically ocular sarcoidosis seems otherwise to act as sarcoidosis in other organs acts. Ocular involvement may be isolated; in most cases concurrent lesions in other organs are demonstrable. Not seldom ocular involvement is the first symptom of the disease. Ocular infiltration is relatively common. Iridocyclitis is the most frequent ocular affection in patients with sarcoidosis. Conjunctival invasion appears to be relatively frequent; episcleritis and keratitis, also fundus changes, are rare. Retinal and choroidal infiltration may give rise to an atypical disseminated choroiditis. Sarcoid tumors of the retina or choroid have been observed. Sarcoid involvement of the optic disk may appear as a characteristic granular tumor in the disk area. Edema or atrophy of the disk may depend on sarcoid lesions of the optic nerve or result from intracranial lesion. Typical neuroretinitis has occasionally been observed in patients with sarcoidosis. Five cases with fundus changes are described.

THERAPEUTICS

Occult Blood in Faeces after Administration of Aspirin. L. T. F. L. Stubbé. *Brit. M. J.* 2:1062-1066 (Nov. 1) 1958 [London].

In an attempt to determine the possible role of aspirin as a cause of unexplained occurrence of occult blood in the stools, the author carried out the benzidine reaction test in 140 patients hospitalized because of some rheumatic complaint. The aspirin was administered in tablets, as a rule in doses of 750 to 3,000 mg. per day. Only after a positive or a negative reaction had been found in 3 successive specimens of feces was the result recorded as such. Of the 140 patients, 38 were male and 102 female. Twenty-three (60.5%) of the male patients and 72 (70.6%) of the female patients reacted positively. Of these 95 patients, 79 who needed further treatment with salicyl were given sodium salicylate instead of aspirin; in all these patients the benzidine reaction became negative. In 27 of the 28 patients in whom the possibility of reproducing the phenomenon was examined, the author was able to cause a repetition of the positive or negative reactions to the benzidine test by administering or not administering aspirin. This proved conclusively that aspirin was the cause of the loss of blood. The results obtained in the 140 patients treated with aspirin for their rheumatic condition were entirely comparable to those found in control groups, consisting of 40 healthy volunteers. The quantity of aspirin administered did not have a great influence on the occurrence and the seriousness of the disorder.

Identical results were obtained when 500 mg. of aspirin in powder form suspended in water was administered to a small group of 4 patients and 6

healthy volunteers 3 times daily after meals; these persons had previously shown a positive benzidine reaction after taking one tablet containing 500 mg. of aspirin 3 times daily. A tentative trial with coated aspirin tablets was carried out in 20 patients who were showing a positive benzidine reaction caused by taking ordinary aspirin tablets. In 5 of these 20 patients the benzidine reaction became negative within 4 to 7 days after taking the coated tablets, in 2 others the reaction became clearly less strongly positive, but in the remaining 13 the positive reaction after an average of 13 days was still unchanged in intensity. It was possible to demonstrate spectroscopically and spectrophotometrically that a positive benzidine reaction after the taking of aspirin is indeed due to the presence of blood. In a few patients it was shown, on the basis of the strength of the benzidine reaction, that the quantity of blood lost when aspirin was taken may not always be ignored.

Use of Iproniazid in Ischaemic Angina Pectoris. M. K. Towers and P. Wood. *Brit. M. J.* 2:1067-1068 (Nov. 1) 1958 [London].

The authors carried out a preliminary trial with iproniazid (Marsilid), a derivative of isoniazid, in 40 patients with angina pectoris. In all but 5, the electrocardiogram showed changes of previous cardiac infarction or present coronary insufficiency. Iproniazid was given in doses of 50 mg. 2 or 3 times daily. The patients began to improve 5 days to 1 month after treatment was instituted, the average period being about 2 weeks. After one month of treatment 17 patients had pain only occasionally, and much greater effort was required to provoke it. An additional 14 patients were improved but still had anginal pain on moderate effort. Of the remaining 9 patients, 1 died, the condition of 4 was unchanged, and 4 stopped taking the drug after 1 or 2 weeks because of side-effects. Nineteen patients were followed for 3 months or more, and the improvement was maintained in all but 2. After one month the electrocardiogram was improved in 9 patients, unchanged in 19, and worse in 5. Of the patients followed for 3 months or more, the electrocardiogram was improved in most but was unchanged in 4 and worse in 2.

Side-effects occurred in most patients after 1 to 4 weeks of treatment. The commonest was dizziness (light-headedness) which was present in 15 patients; it was severe in 5 patients and required withdrawal of the drug. Pulmonary edema, presumably from fluid retention, occurred in 2 patients. The blocking of anginal pain may encourage the patients to be more active and may precipitate infarction. Because of this and the side-effects, the drug is not indicated for patients with mild angina pectoris. In the patient with severe and intractable anginal pain it is of great value, especially if anti-

coagulant therapy can be given in addition. The patient can often be helped over a prolonged ischemic attack, the drug being withdrawn when the condition improves.

Rauwolfia Serpentina in Hypertension: Four Years' Experience. L. R. Doffermyer, C. W. Byrd, and W. H. Lilly. *North Carolina M. J.* 19:430-433 (Oct.) 1958 [Winston-Salem].

The effectiveness of rauwolfia as a hypotensive agent when administered as the sole therapeutic drug has been studied in 152 unselected, ambulatory patients with hypertension. In most of the patients the disease was of the type commonly diagnosed as "essential" hypertension. One hundred six of the 152 patients were female and 47 were male, with ages ranging from 32 to 87 years. All patients were treated with 200 to 600 mg. (usually 300 mg.) of whole root rauwolfia (Raudixin) daily for from 6 months to 4 years. In several cases, 600 mg. were given daily for the first week, this dose being adjusted thereafter to 300 or 400 mg. No hypotensive drugs other than rauwolfia were given. The 152 patients were divided into 3 groups according to the pretreatment diastolic pressures of the patients. Group I included 34 patients in whom the diastolic pressure averaged 90 mm. Hg; group II included 89 patients with diastolic readings greater than 90 mm. Hg but less than 120 mm. Hg; and group III included 29 patients with diastolic pressures of 120 mm. Hg or higher.

The average fall in the blood pressure for the whole group was 28 mm. Hg. There was a significant fall in the mean blood pressure (20 mm. Hg or more) in 117 (76%) of the 152 patients during treatment. Ninety-two (60%) of the 152 patients became normotensive. There was no significant or consistent difference in the fall in blood pressure between the two sexes. The greater declines were observed in patients with the highest pretreatment mean readings, regardless of age or sex. All but 1 (97%) with initial diastolic pressures of 90 mm. Hg reached normal blood pressure levels, whereas 46 (51%) of the 89 patients in group II with initial diastolic levels between 90 and 120 mm. Hg became normotensive. Only 3 (10%) of the 29 patients in group III with pretreatment diastolic readings of 120 mm. Hg or higher reached normal levels. In 3 patients, 1 female and 2 males, all from group 2, the blood pressure remained normal for 8 to 12 months after the drug was discontinued. Symptomatic response to rauwolfia was rated as good to excellent in 140 (92%) of the 152 patients. No significant difference in response which could be related to sex or age was observed. In 11 patients, the symptomatic response to rauwolfia was rated as only fair. One patient suddenly died. One patient complained of mild nasal stuffiness, another of diarrhea and upset stomach. No other side-effects were observed. *Rauwolfia serpentina* (Raudixin), as

the sole antihypertensive medication in this series of ambulatory patients, has proved to be a satisfactory hypotensive agent, with remarkable freedom from unwanted side-effects.

Treatment of Ulcerative Colitis with Local Hydrocortisone Hemisuccinate Sodium: A Report on a Controlled Therapeutic Trial. S. C. Truelove. *Brit. M. J.* 2:1072-1077 (Nov. 1) 1958 [London].

In an attempt to show whether hydrocortisone sodium succinate has a beneficial action when applied locally in ulcerative colitis, the drug was given a therapeutic trial in 40 patients with active symptoms of ulcerative colitis. In the first part of the trial the patients were allotted in a random order to treatment with either hydrocortisone sodium succinate or an inert preparation consisting of 20 to 30 mg. of freeze-dried dextran which corresponded in volume to 100 mg. of hydrocortisone sodium succinate. Treatment consisted in dissolving the drug or the inert preparation in 120 cc. of isotonic sodium chloride solution and dripping the solution into the rectum at night. At the end of one week of treatment the 20 patients receiving hydrocortisone therapy showed a striking advantage over the 20 who received the inert preparation, not only with respect to the clinical state but also with regard to the sigmoidoscopic and histological appearances of colonic biopsy specimens.

All 40 patients were then given nightly rectal drips with a hydrocortisone solution containing the soluble ester salt in an amount equivalent to 100 mg. of hydrocortisone itself to which 1 million units of penicillin and 1 Gm. of streptomycin were added. In treatment group A, consisting of 20 patients with only 1 in clinical remission, 12 additional patients went into remission in the course of 2 weeks; in treatment group B, consisting of 20 patients with 11 in remission, another 5 became symptom free at the end of 2 weeks. By comparison with other studies in which antibiotics were not used, the addition of antibiotics seems to confer a small gain in the number of successes with topical hydrocortisone therapy, although at the price of exacerbation of symptoms occurring in a few patients from the direct application of antibiotics to the inflamed colon.

Twenty-six of the 29 patients who were in clinical remission after open therapy were entered for a trial maintenance therapy on 2 consecutive nights a week only (week-end maintenance therapy) lasting 6 months. Thirteen of these 26 patients received hydrocortisone, and the other 13 received the inert preparation. The clinical course of the 2 groups was identical, each having 5 patients who suffered relapses during the 6-month period. Week-end maintenance therapy with hydrocortisone applied locally is, therefore, ineffective in reducing the chance of relapse. The reported data, however, show that

hydrocortisone sodium succinate administered in a rectal drip produces rapid clinical remissions in a considerable proportion of patients with mild to moderate attacks of ulcerative colitis. These clinical remissions are accompanied by improvement in the sigmoidoscopic appearances and by lessening of the inflammatory changes seen in biopsy specimens of the colon. It is probable that hydrocortisone sodium succinate acts chiefly by some direct effect on the actual mucosa of the colon.

Treatment of Ulcerative Colitis with Topical Hydrocortisone Hemisuccinate Sodium: A Controlled Trial Employing Restricted Sequential Analysis. G. Watkinson. *Brit. M. J.* 2:1077-1082 (Nov. 1) 1958 [London].

Sixteen patients with hemorrhagic proctocolitis or colitis were treated on 10 occasions with hydrocortisone sodium succinate and on 9 occasions with an inert preparation, 3 patients being treated twice. There were 6 men and 10 women, between the ages of 25 and 74 years. Both the drug and the inert preparation were dissolved in 100 cc. of isotonic sodium chloride solution, and the solution was administered as a rectal infusion. The infusion was retained overnight and was repeated on 15 successive evenings. In more severely affected patients in whom nocturnal diarrhea might prevent the retention of the infusion, an intravenous injection of 15 to 30 mg. of propantheline was given half an hour before the infusion to aid retention overnight. Treatments were allocated to pairs of patients in a random order, and the course of the trial was followed by accumulating the qualitative comparisons between treatments which are provided by each pair of patients. Results were recorded on a chart while the trial was in progress, the boundaries of which determined the minimum number of observations necessary to establish a significant advantage in favor of one treatment. The results of this statistical technique of restricted sequential analysis were as follows. Of 10 patients receiving potent therapy, all but 1 went into clinical remission as compared with only 1 of 9 patients receiving inert treatment. Two patients, however, showed slight improvement after inert therapy. Mucosal appearances became normal in 3 and improved in 6 of the 10 patients receiving the potent agent and contrasted markedly with those receiving the inert treatment, only 3 of whom showed slight improvement. Four of the 10 patients treated with hydrocortisone remained in clinical remission for 6 to 9 months. Three had relapses but responded to further courses of treatment. The one patient showing remission on inert therapy relapsed within one month after discontinuation of therapy. Thus, most of the patients receiving potent hydrocortisone therapy improved and those receiving inert therapy became worse. In 2 patients serving as their own

controls, placebo therapy failed to induce improvement, while a remission resulted from hydrocortisone therapy.¹ Comparison by sequential analysis showed that symptomatic remission and improvement in mucosal appearances were significantly more often induced by potent than by inert treatment.

Treatment of Drug-resistant Cases of Pulmonary Tuberculosis with Cycloserine and Pyrazinamide. J. A. Ritchie, A. E. R. Campbell, J. Cuthbert and L. G. Bruce. *Tubercle* 39:289-295 (Oct.) 1958 [London].

At 2 hospitals in Glasgow 63 patients with pulmonary tuberculosis and strains of *Mycobacterium tuberculosis* resistant to 2 or more of the 3 drugs, streptomycin, isoniazid, and aminosalicylic acid, were treated at random with cycloserine or pyrazinamide combined with oxytetracycline or one of the 3 above-mentioned common drugs to which the strains were not resistant. The cycloserine group (group C) consisted of 28 patients, and the pyrazinamide group (group P) consisted of 35 patients. Cycloserine was given in the form of Seromycin tablets, and 25 mg. of this proprietary preparation per kilogram of body weight was the initial dose. If complications occurred, this dose was reduced to a tolerance dose. Pyrazinamide was also given in tablets, and the dose varied from 35 mg. per kilogram of body weight per day to a maximum of 2 Gm. The dose of streptomycin was 1 Gm. for 7 days a week; that of aminosalicylic acid, 12 Gm. daily; that of isoniazid, 200 mg. daily; and that of oxytetracycline, 2 Gm. twice daily. The average duration of treatment was 19.7 weeks for the patients in group C and 14.8 weeks for the patients in group P.

Toxic reaction to cycloserine did not occur in 12 of the patients in group C. The remaining 16 patients had muscle tremors of both the involuntary and the intention type, involving mainly the upper extremities. Convulsions occurred in 5 of the 16 patients, and administration of cycloserine and the covering drug was discontinued immediately. The attacks stopped, and a few days later administration of the drugs was restarted with a dose of cycloserine which was 500 mg. less than before. This seemed to control the seizures in 3 of the 5 patients. A marked mental depression occurred in the other 2 patients, in whom treatment had to be discontinued completely after 8 and 11 weeks. Severe mental depression developed in another patient, and treatment also was discontinued. Micropsia occurring in one patient made it necessary to discontinue administration of cycloserine after 27 weeks. Of the 28 patients in group C, the sputum converted to negative in 11 at the end of the treatment. Six patients died before completing the 9-month follow-up period. Roentgenographical-

ly, the condition of 23 of the 28 patients was unchanged, 1 deteriorated, and 4 showed some slight improvement. Most patients gained weight. Toxic symptoms, such as vomiting, tenderness of the liver with acute abdominal pain, and diarrhea, occurred in 7 of the 35 patients in group P. One of these 7 patients died, and autopsy findings suggested atrophy of the liver. The sputum converted to negative at the end of the treatment period in 15 of the patients in group P. Four patients died before completing the 9-month follow-up period. Eleven patients showed some improvement roentgenographically, and the condition of 24 was unchanged.

At the end of the 9-month follow-up period the sputum of 3 of the 22 survivors in group C was still negative on culture, and of the 30 survivors in group P, 7 still had negative sputums on culture, including 1 who had satisfactory surgical treatment. Toxic effects were less serious with cycloserine than with pyrazinamide. Patients treated with cycloserine had a general feeling of well-being and gained, on the average, more weight than those treated with pyrazinamide. The clinical impression was that neither drug was as effective as streptomycin or isoniazid. The Bromsulphalein liver function test as a sign of liver damage resulting from pyrazinamide was of little value in the authors' hands.

The Use of a New Long-Acting Sulfonamide. A. Ravina. *Presse méd.* 66:1595-1596 (Oct. 15) 1958 (In French) [Paris].

Administration of a new sulfonamide, sulfamethoxy-pyridazine, can rapidly produce a high concentration of the drug in the blood, capable of lasting over a long period at an efficacious level. It can be given at fairly long intervals, generally once every 24 hours. Results of its use in 32 patients with pyelonephritis were favorable in 16 cases; there was some improvement in 10 cases and failure in 6. Forty out of 57 patients with trachoma, who received 80 to 120 mg. per kilogram every 7 to 10 days for 3 months, were cured. Serious urinary infections in 28 older patients were treated with a total of about 15 Gm. of sulfamethoxy-pyridazine; 80% of these patients had satisfactory results, 4% had rather good results, and 16% were unaffected by the drug. In a group of 40 patients with various diseases, the majority of those with furunculosis, otitis media, erysipelas, and gonorrheal urethritis were cured. Urethritis was cured in 5 to 7 days by a daily dose of 2 Gm., scarlatina in 4 days by a daily dose of 2 Gm., acute blepharitis in 8 days by a daily dose of 500 mg., and facial erysipelas in 45 hours by a total of 1.5 Gm. of sulfamethoxy-pyridazine. In a group of 12 patients with anthrax, the drug had excellent results in 9 cases and good results in 2; the 12th patient showed intolerance to the drug.

Bacteriological examinations of the urine showed that *Staphylococcus*, *Streptococcus*, and, in general, gram-negative organisms were more sensitive to sulfamethoxypyridazine than were colibacilli. Sulfamethoxypyridazine was found in the blood 96 and even 168 hours after the administration of 2 Gm. and from 48 to 96 hours after the administration of 1 Gm. Urinary elimination of the drug is always very slow. It penetrates the cerebrospinal fluid better than the majority of other sulfonamides. It is very effective in pediatrics. About 83% of 102 infants and children with bronchial or rhinopharyngeal diseases responded favorably to treatment with sulfamethoxypyridazine. It is easy to administer and is rapidly absorbed, and a daily dose of 15 mg. per kilogram maintains a sufficiently high level of plasmatic concentration without danger of excessive accumulation. Secondary reactions to the drug are few. Headache, the most frequent symptom, seems to be related to the size of the dose, but it is never present with the usual dose of 1 Gm. One investigator believes that sulfamethoxypyridazine increases the number of blood platelets.

PATHOLOGY

Embolism Caused by Cholesterol Crystals in Atherosclerosis. H. E. Schornagel. *Nederl. tijdschr. geneesk.* 102:1741-1743 (Sept. 6) 1958 (In Dutch) [Amsterdam].

Atheromatous plaques may ulcerate, and the possibility exists that atheromatous material may enter the blood stream. The author cites Winter's report on 2 patients with atheromatous embolism of the brain. The emboli had originated from cholesterol crystals, which in turn were derived from ulcerations in an aneurysm of the aortic arch. The author reviews results of his own earlier autopsy studies. Small emboli in the coronary arteries he regards as particularly important, because in these arteries atherosclerotic changes often occur at a relatively early age. He had found that after deaths from cardiac infarct there existed in 60% of the patients, in addition to the more or less severe atherosclerosis, a thrombus that occluded the coronary artery. Such a thrombus was found especially in coronary arteries in which the intima had been damaged by atheromas. In many instances bleeding into the atheroma was associated with perforation of atheromatous material into the lumen, and this in turn led to the formation of the thrombus. In most other cases, diffuse sclerosis of the coronary arteries and the resulting narrowing of the lumen was the cause of the ischemic damage to the heart muscle and of death. There were a few cases in which hemorrhage into an atheroma had caused sudden narrowing and closure of a coronary artery; and in rare cases death was caused

by profuse intramural bleeding, a dissecting aneurysm, in a nonsclerotic coronary artery, either after great exertion or as the result of trauma to the chest wall.

Besides the aforementioned changes in coronary vessels, which influence the supply of blood to the cardiac muscle, there exists in the presence of extensive coronary sclerosis the possibility that embolisms of cholesterol crystals occur in the arterioles of the heart muscle. As an example the author cites the case of a 32-year-old man with a fibrous, old heart infarct, who died a week after an attack of angina pectoris. The heart muscle contained cholesterol crystals in cleft-like spaces in the peripheral branches of the coronary arteries, and around these was a leukocytic reaction with a predominance of eosinophilic leukocytes. A 58-year-old man had syphilis and extensive atheromatosis of the aorta and a fibrous infarct on the anterior wall of the left ventricle with aneurysmatic dilatation, and a lateral cardiac infarct. Autopsy revealed in the vessels of the heart muscle, emboli of atheromatous material, crystals as well as large lipophages, but without any reaction in the surroundings; they were presumably of recent origin. Similar cholesterol crystal emboli were found in this man also in the spleen, in the adrenals, and in the intestine. Some of the emboli in the kidneys originated from atheromatous debris, without reaction, and some with foreign-body giant cells, and older ones were incorporated into a wide fibrous intima of the arteries. There were also multiple small infarcts in the kidneys.

Although such generalized cholesterol crystal embolization is rare, it has been discussed in several recent reports. The appearance of foreign-body giant cells during the early stage of these cholesterol crystal emboli is characteristic, and it has been assumed that they get stuck in the vessel wall, probably as the result of vascular spasms. Later the giant cells disappear and the crystals are enveloped by connective tissue.

The author feels that, in the future, damage to the kidneys by massive emboli of atheromatous origin is likely to become more common, because of the increase in aortic transplantations. Pressure changes and manipulations during these operations are likely to cause ruptures of atheromatous plaques, with resulting entrance of atheromatous debris into the blood stream.

The Intestinal Factor in Irreversible Endotoxin Shock. R. C. Lillehei and L. D. MacLean. *Ann. Surg.* 148:513-525 (Oct.) 1958 [Philadelphia].

The chief autopsy finding in dogs dying of either irreversible hemorrhagic or endotoxin shock is hemorrhagic necrosis of the mucosa of the intestine. In irreversible hemorrhagic shock, the bowel necrosis is apparently a result of critical ischemia due to vasoconstriction and oligemia and is re-

sponsible before death for a progressive loss of plasma volume and an increasing hematocrit. There is increasing evidence that endotoxins also produce their deleterious effect by their ability to incite severe and lasting vasospasm in the small arteries and veins. As in hemorrhagic shock, the effects of this vasoconstriction are particularly severe in the bowel and also as in hemorrhagic shock, the authors measured in endotoxin shock a progressive decrease in plasma volume, increase in hematocrit, and an increase in plasma hemoglobin which foretell the hemorrhage necrosis of the bowel seen at autopsy. A number of drugs (chlorpromazine, Dibenzylamine, metaraminol, norepinephrine, and hydrocortisone) and antibiotics have been used to alter the response of animals to endotoxin as well as to prolonged hemorrhage. In addition, enterectomy, hypothermia, and fluid replacement for lost plasma have been employed to alter the response of animals to hemorrhagic shock. In the present study, the authors record the effectiveness of all these procedures in altering the responses to endotoxin which they believe are characteristic of the irreversible state in the dog. One hour before the experiment the dogs were given morphine sulfate and placed on a table.

Using local procaine anesthesia, a plastic cannula was advanced into the aorta via a femoral artery and attached to a mercury manometer to monitor blood pressure during the experiment. Both femoral veins were also cannulated for the giving of medications and the taking of blood samples. Plasma volumes and hematocrits were measured on all dogs before the endotoxin was given and at 90 minute intervals thereafter for periods up to 8 hours. These measurements were repeated if the dog was alive on the day following an experiment. All dogs dying during the course of the experiments were autopsied. Following the preliminary measurements, the dogs were given an intravenous lethal dose of crude endotoxin prepared as previously described from killed *Escherichia coli* bacteria. Each new batch of crude endotoxin used was assayed on a new group of control dogs to establish the dose lethal for 95% of adult dogs. The dose of endotoxin used in these experiments averaged 7.5 mg. per Kilogram of body weight. Ten groups of dogs were studied with various forms of pretreatment. Summarizing the results the authors say that plasma loss, hematocrit increase, plasma hemoglobin increase, and hemorrhagic necrosis of the bowel, all of which characterize irreversible shock due to endotoxin, apparently result from sympathomimetic action of endotoxin on the bowel. Agents which have an adrenergic blocking effect prevent death while the vasopressor drugs which are commonly used to treat this type of shock either are without effect or else actually potentiate the shock caused by endotoxin by increasing intestinal ischemia.

PHYSIOLOGY

Movement of the Cerebrospinal Fluid in the Cerebral and Spinal Cord Spaces. Y. E. Moskalenko and A. I. Naumenko. *Physiol. J. USSR* (no. 9-12) 43:855-860, 1957 [New York].

Low-frequency electroplethysmography tracings were obtained from cats under general anesthesia at the department of physiology of the First Pavlov Medical Institute in Leningrad, permitting recording of changes in the electrical conductivity of the cerebrospinal fluid and blood in the cavities of the brain and spinal cord. Four trephine openings with a diameter of 5 mm. were made, 2 in the parietal bones and 2 in the vertebral column. Into these openings silver electrodes were screwed, and the openings were then sealed with collodion to restore the air-tight condition of the cerebrospinal spaces. An alternating current of 10,000 cps was delivered to the electrodes, and the passing of this current over a considerable period of time did not have any apparent effect on the experimental animal. The recording of changes in the electrical resistance of the cerebrospinal fluid and blood was effected with a specially devised apparatus.

Results showed that the displacements of the cerebrospinal fluid associated with the respiratory movements of the animals were in opposite phase in the cerebral and spinal spaces; during inspiration electrical resistance diminished in the craniocerebral space and increased in the spaces of the cord, and during expiration the reverse relationship held, pointing to both anatomic and physiological "antagonism" between these areas. In the respiratory shifts of the cerebrospinal fluid from the cerebral space into the spinal canal, an average of about 12 to 15% of the fluid was involved. In addition to the respiratory shifts there were still the so-called displacements of the third order. These are very slow movements, occurring at a rate of 30 to 40 per hour, not always regular and sometimes feebly expressed. Movements of the third order are shifts of certain quantities of the cerebrospinal fluid from the cerebral space to the spinal space and in the reverse direction, the volume constituting about 30% of the cerebrospinal fluid. The authors' observations suggest that these movements of the third order are connected with the activity of the vasomotor centers. The summated movement of fluid proved to be not regular, as the resultant movement depends on differently phased cardiac and respiratory movements and on waves of the third order. These displacements of fluid reach maximum proportions when the phases coincide, and when they are antithetical, the changes are much reduced. The movements of the cerebrospinal fluid associated with inspiration and expiration are the result of different conditions affecting the outflow of venous blood from the brain and spinal cord spaces.

BOOK REVIEWS

Atlas of Technics in Surgery. By John L. Madden, M.D., F.A.C.S., Director of Surgery, St. Clare's Hospital, New York. With 62 contributing authors discussing illustrated surgical technics. Cloth. \$30. Pp. 648, with 1,843 illustrations by Alfred Feinberg and Robert Wabnitz. Appleton-Century-Crofts, Inc., 35 W. 32nd St., New York 1, 1958.

To write an atlas of this type is a large undertaking. Dr. Madden and his contributors have combined their talents to produce a worthwhile atlas of surgical techniques but it must be emphasized that a book of this type would fall far short of its mark if the art work were not of the same caliber as the written text. Hence, special commendation must be given to the illustrators. The techniques illustrated represent those that have proved satisfactory in the hands of the author. Each operation is discussed not by its originator but rather by another surgeon who is particularly qualified in its performance. The various discussants have stressed important points and differences of opinion and stated their own preferences. This is a particularly valuable feature of the book. Many commonplace procedures have been included, as well as some of the newer and more extensive techniques, such as valvotomies, embolectomies, aortic grafts, and hepatic lobectomies. Although for the experienced operator many of the surgical minutiae in this text would provoke a divergence of opinion, the general presentation in this atlas should prove helpful and can be recommended to those interested in surgical technique.

Iron in Clinical Medicine. Edited by Ralph O. Wallerstein, M.D., and Stacy R. Mettler, M.D. [An international symposium.] Cloth. \$6. Pp. 283, with illustrations. University of California Press, Berkeley 4; 214 Royce Hall, University of California, Los Angeles 24; Cambridge University Press, Bentley House, 200 Euston Rd., London, N. W. 1, England, 1958.

This volume consists of 23 papers dealing with the absorption, transportation, and storage of iron in the body and the use of iron preparations in the treatment of iron-deficiency anemia. These papers were presented at a symposium held at the University of California School of Medicine in San Francisco in January, 1957. The participants included leading investigators from the United States and abroad. The sections dealing with the metabolism of iron present a comprehensive and up-to-date

summary of current knowledge in this field. In the clinical section the use of the new iron-dextran parenterally administered iron preparation is emphasized. The book should serve as a useful reference source on the pharmacology of iron.

A Method of Anatomy, Descriptive and Deductive. By J. C. Boileau Grant, M.C., M.B., Ch.B. Sixth edition. Cloth. \$11. Pp. 879, with 862 illustrations. Williams & Wilkins Company, 428 E. Preston St., Baltimore 2, 1958.

This new edition of one of the leading textbooks of anatomy presents its subject by regions, but the unique emphasis is on the presentation of principles and correlation of facts and on the significance of morphology in acquiring an understanding of structure related to function. This book is not an encyclopedia of anatomy. The arrangement and organization of subject matter is such that a great degree of freedom in dissection sequence can be used without any sacrifice of unity or continuity in the text. Although the author has published a dissection manual, this volume can be used efficiently without a manual since procedures are presented which can serve as guides to dissection but whose main objectives are to emphasize relations and other principles of the morphology under study. The principal features of embryologic development are presented where essential to an understanding of adult structures, including anomalies. Details of the central nervous system and microscopic anatomy are minimal. The new international anatomic nomenclature (approved by the Sixth International Congress of Anatomists, Paris, 1955) is used throughout. Where there is a substantial difference between old and new terminology both are given. The regions presented are upper limb, abdomen, perineum and pelvis, lower limb, thorax, and head and neck, in that order. A general and a miscellaneous section complete the book proper. In 879 pages there are 862 figures and 23 tables. The figures are line drawings and diagrams carefully selected and drawn to show structures, relationships, and key features with unusual clarity and simplicity. There is a list of selected references and an index. The print is clear and easy to read with important structures, areas, and relations in boldface type or italics. The binding is attractive and sturdy. While this textbook is intended primarily for medical students taking gross anatomy, advanced students and physicians should find it a refreshing presentation of regional human anatomy.

QUESTIONS AND ANSWERS

URIC ACID AND PREECLAMPSIA

TO THE EDITOR:—What would be the level of the blood uric acid in a patient for a mild preeclampsia to develop into a severe case or vice versa? Suppose a preeclamptic "quieting down" in all respects occurs, i. e., loss of edema, decrease to normal blood pressure, and absence of albuminuria, while at the same time there is a progressive rise in daily blood uric acid levels, for instance, from 7.5 to 8.0 to 10.0 to 10.5 mg. %. Would it be the agreement of authorities in such a case to terminate the pregnancy? What is the significance of a rising blood uric acid level in a patient with preeclampsia with or without other signs and in one with the so-called unclassified toxemia, "fluid retention"? Is a rising blood uric acid level in a patient with "pure" fluid retention, in whom dietary measures alone mobilize fluid, an artifact?

Louis F. Campana, M.D., Williamsport, Pa.

ANSWER.—Chesley (*Am. J. Obst. & Gynec.* 38:430, 1939) quoted the report of Stander and Cadden that in eclampsia the blood uric acid level is increased; concomitantly, there is little or no increase or only later increases in the other nitrogenous metabolites of the blood. High blood uric acid levels are also found when the nonprotein nitrogen level rises because of renal impairment. This suggests that absolute values for the blood uric acid may not have as much significance in toxemia of pregnancy as would the ratio of uric acid to some other substance. Accordingly, Chesley made a study of the ratio between the blood uric acid and the nonprotein nitrogen levels. He concluded that the absolute level of blood uric acid is often elevated in eclampsia. More generally, the ratio of uric acid to nonprotein nitrogen is increased. The upper limit of normal for this ratio is about 10%. Chesley (*Am. J. Obst. & Gynec.* 59:960, 1950) also showed that the simultaneous renal clearances of urea and uric acid usually make a clear-cut separation for diagnoses of preeclampsia, hypertensive disease, and renal disease. In uncomplicated hypertensive disease, both clearances are normal; in renal disease, both are low; and in preeclampsia, the uric acid clearance is disproportionately depressed. Dieckmann (*The Toxemias of Pregnancy*, ed. 2, St. Louis, C. V. Mosby Company, 1952, p. 121) said that star-

vation, a high fat diet, blood concentration, and an oliguria or anuria all result in a rapid increase in the uric acid concentration. There is no significant change in normal pregnancy. The uric acid concentration is increased in eclampsia and preeclampsia. Stander contended that the uric acid content in the blood may be regarded as a fairly safe criterion of the severity of the preeclampsia or the eclampsia. Since the concentration of uric acid may be changed by various factors, Dieckmann thought that the increased concentration in eclampsia could be attributed to the oliguria. Normal uric acid values have been reported in proved cases of acute yellow atrophy of the liver. Stander reported a high blood uric acid concentration in chloroform poisoning. These contradictory results may be attributed to impairment in both the formation and the destruction of uric acid. Crawford reported that the plasma uric acid level increased immediately after the onset of convulsions in patients with toxemia. Similar findings were obtained after artificially produced convulsions in nonpregnant patients. Because of the contradictions in the literature specific answers cannot be given to the four questions asked.

LYMPHEDEMA

TO THE EDITOR:—A 40-year-old woman has a diffuse swelling of the right leg extending from the ankle up to the thigh. About a year prior to the onset of this swelling, she injured her ankle; otherwise, she has had no injury to this leg or any history of infection or varicose veins. The clinical picture suggests lymphedema for which no cause has been found. The other leg is entirely normal. The patient is able to work but complains of unsightliness of the leg and some tiredness on any extensive walking or stair climbing. Is there any form of therapy other than elastic support? The patient does not seem to have reached the stage where extensive excision of the subcutaneous tissues is indicated.

M.D., New York.

ANSWER.—The condition described is undoubtedly lymphedema. It seems unlikely that the earlier injury had anything to do with it unless there was an infection which led to fibrosis and sclerosis of some of the major lymphatic channels or lymph nodes. Since most forms of lymphedema affect the lower extremities primarily, gravity has a major role in producing the swelling and causing it to persist. Occasionally, if the patient is kept flat in

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

bed with the affected leg elevated enough fluid will drain out so that a properly applied elastic roller bandage will keep the leg fairly well reduced in size. Elastic stockings are apt to be much less satisfactory than a properly applied elastic roller bandage. The less time a person must stand on his feet, the less opportunity there is for gravity to produce its effect. Operations either to remove the chronically diseased fibrotic tissue or to try to establish a lymphatic bridge are sometimes helpful but have not been notably successful. Certainly an operation is not indicated in the patient described.

RECURRENT JAUNDICE

TO THE EDITOR:—In 1950, two months after immunization for yellow fever, a patient developed jaundice. At that time the total bilirubin value was never more than 3 mg. per 100 cc. Results of numerous thymol turbidity and cephalin flocculation tests, determinations of blood protein levels, and a liver biopsy were all reported as normal. The patient was examined at several army installations and was finally discharged with a diagnosis of "chronic hepatitis," although constitutional hepatic insufficiency was also considered. It is not stated on his Army record whether hepatosplenomegaly was present at any time. He now states that during the seven intervening years he has had what he calls "bad attacks," averaging about twice a year. These attacks come on suddenly, the eyes becoming jaundiced, the stools light, and the urine dark. The jaundice lasts two to seven days. The patient feels weak and ill, but he is not certain whether fever has ever existed. During these episodes he may lose 20 lb. (9.1 kg.). In the interim he feels well, although at times he has minor episodes in which he feels weak and may have to lay off work for two or three days.

He has been seen on two occasions, during which he complained of abdominal distress. On the first he had a temperature of 101.8 F (38.8 C) at the onset. Examination during one attack revealed no definite hepatosplenic enlargement, but he had tenderness in the left flank near the umbilicus. On the first occasion (almost two years ago) the one-minute direct bilirubin test showed a value of 0.1 mg. per 100 cc. of serum; the total value was 2.8 mg. per 100 cc. The cephalin flocculation was 3+. Sulfobromophthalein retention was 16% in 15 minutes and 7% in 30 minutes. The blood protein level was 9.09 Gm. per 100 cc., with 6.29 Gm. of albumin and 2.8 Gm. of globulin per 100 cc. The alkaline phosphatase level was 4 Bodansky units. The prothrombin time was normal. The sedimentation rate was normal. The white blood cell count was normal, with a normal differential

count. The hemoglobin level was 14.8 Gm. per 100 cc, with 1% reticulocytes. The hematocrit value was 40%. Serology tests gave negative results. The blood cholesterol level was 163 mg. per 100 cc. A Graham-Cole test of gallbladder function showed negative findings. An intravenous pyelogram and a roentgenogram of the abdomen showed normal results. The urine was negative for bile acids and bile pigments. Stools and material obtained by duodenal drainage were negative for ova, parasites, and pathogenic organisms.

On the second occasion he had epigastric distress, particularly in the right upper quadrant with some referral at times to the shoulder, and, occasionally, hiccups. When he was first seen, there was merely tenderness over the right upper quadrant and on pressure over this quadrant some pain radiated to the shoulder and the anterior part of the thorax. This was particularly true if a deep breath was taken while the right upper quadrant was being palpated. No jaundice of the eyes was present until a period of 14 days had elapsed, when this condition appeared and, also, light stools. About one week after this, a definitely palpable liver and spleen were present. During this illness there was no rise in temperature. Repetition of a gallbladder series at this time revealed no pathology. The cephalin flocculation was 1+ at 48 hours, and the direct bilirubin value was 0.77 mg. per 100 cc. of serum. Thymol turbidity was 1 unit. Sulfobromophthalein retention was 16% in 15 minutes and none in 30 minutes. The transaminase value was 45 units. Examination of a blood smear revealed a normal red blood cell structure. The hemoglobin level was 15.5 Gm. per 100 cc. with a reticulocyte count of 2%; a repeated reticulocyte count was 1.5%. The sedimentation rate was normal. There was 7.9 Gm. of serum proteins per 100 cc., with 6.1 Gm. of albumin and 1.8 Gm. of globulin per 100 cc. The blood uric acid level was 5.9 mg. per 100 cc. The urinary amylase value was 84 units, and the urine was negative for bile acids and bile salts. Stools revealed no abnormal amounts of fat. Two weeks after the appearance of the splenomegaly, the liver and spleen were no longer palpable.

Is this condition "cholangiolitis" rather than parenchymal "hepatitis"?

M.D., Washington.

ANSWER.—This patient presents a difficult and unusual problem. Essentially it is a case of recurrent jaundice over a period of seven years with no laboratory evidence of parenchymal liver disease except for a single positive cephalin-cholesterol flocculation test. Under these circumstances it is necessary to consider the four types of jaundice,

namely, hemolytic, retention, that due to parenchymal liver disease, and that due to extrahepatic obstruction. Hemolytic jaundice can be quickly ruled out because of the presence of light stools and dark urine, although one cannot eliminate the possibility of a hemolytic factor associated with one of the other forms of jaundice. Retention jaundice, as seen in constitutional hepatic insufficiency or as sometimes occurs after an attack of acute viral hepatitis, can be ruled out for similar reasons, as well as the fact that the prompt direct serum bilirubin value was distinctly elevated on one occasion. Extrahepatic obstructive jaundice would appear unlikely in view of the normal gallbladder visualization, the absence of pain, and the essentially normal level of serum alkaline phosphatase. Cholangitis due to bacterial infection would not occur in the absence of obstruction and, in addition, would be associated with chills and fever. Spasm of the ampulla of Vater, as described in the French literature, must be considered as a possibility, but the diagnosis is difficult to make and it is highly unlikely in this case because of the occurrence of splenomegaly. By the process of elimination, it would thus appear most likely that this patient has some type of low-grade parenchymal liver disease associated with icteric relapses. Cases of chronic progressive viral hepatitis of this sort do occur and are not necessarily associated with liver damage. The condition of such patients tends to relapse in association with acute intercurrent infections or with overexertion. In such cases, the spleen may become enlarged and the jaundice may be due in part to a transitory increased rate of hemolysis. Although unlikely, the possibility of chronic amebic hepatitis must also be entertained. Other etiological forms might be considered, such as leptospiral infection, but these are rather rare.

In the management of this case it would be best to give the patient a course of therapy with chloroquine, 250 mg. twice a day for two or three weeks. If this is without benefit, then amebiasis can be ruled out. After this, a biopsy should be performed to make certain that extensive liver damage is not present. Although it would appear unlikely, nevertheless laboratory procedures cannot be completely relied on in this regard. A biopsy should also establish the presence of some inflammatory reaction in the parenchymal tissue and firmly establish the diagnosis. Treatment of chronic relapsing viral hepatitis should consist of avoidance of secondary infections and overexertion. During episodes of relapse, physical activity should be restricted. Diet is probably of no importance. Steroid therapy, such as the administration of prednisone, may be effective if there is an element of hypersplenism. In some cases splenectomy is justified. This, however, is a difficult matter to determine without actual measurements of survival times of red blood cells.

Elevated values for reticulocytes and increased erythropoiesis in the bone marrow are suggestive evidence in this regard.

PROPHYLACTIC GASTRECTOMY

TO THE EDITOR:—In 1943, a 27-year-old man with no familial history of pernicious anemia underwent a three-fourths gastric resection because of histamine-fast achlorhydria, prepyloric lesion, and diarrhea. On histological examination, the operative specimen showed nonspecific gastritis. Through the following years the patient suffered from a severe dumping syndrome, slight hypochromic nutritional anemia, and moderate loss of weight. He has been on therapy with 30 mcg. of vitamin B₁₂ given intramuscularly once a month and has shown no evidence of pernicious anemia. He is now 43 years old and in fairly good health, but a radioactive cobalt (Co⁶⁰) assay with vitamin B₁₂ showed no excretion in 24 hours in the urine. The findings seem to indicate a true pernicious anemia well treated. The patient is concerned because of the increased incidence of cancer of the stomach, even though he has the cardia and a small fundal portion left. Hitchcock's group at Minnesota is said to show figures that indicate a 5% probability of cancer in patients with pernicious anemia. They advise gastroscopic studies every three months. Does the increased incidence of cancer warrant total gastrectomy in either this patient or others with pernicious anemia without gastrectomy? Will gastroscopy give enough visualization in the small remaining cardia to be repeated every three months? The patient has had a gastrointestinal series annually since 1943. Should roentgenograms be made less often? What are the after-effects of total gastrectomy and its operative mortality?

M. D., Michigan.

ANSWER.—The diagnosis of pernicious anemia in this case seems established, although the radioactive cobalt (Co⁶⁰) assay of vitamin B₁₂ would have been more conclusive if a normal excretion of the vitamin had been shown to follow the injection of Co⁶⁰-labeled vitamin B₁₂ given concomitantly with intrinsic factor. The increased incidence of gastric malignancy in patients with pernicious anemia reported by Hitchcock seems to have resulted from selected population studies. Other unselected series have failed to demonstrate an increased incidence of gastric carcinoma in patients with pernicious anemia, and certainly the magnitude of increase, if present, does not exceed the normal by more than four times. The increased incidence of cancer is, in an unqualified sense, not sufficient to warrant total gastrectomy either in this patient or in others with pernicious anemia.

without gastrectomy. This patient, with severe dumping and weight loss after a partial resection, faces a risk of further inanition, secondary infection, and depletion syndromes which in themselves may be fatal even if gastrectomy is accomplished successfully. Total resection would be justified only if malignancy were proved to be present. A well-trained endoscopist can frequently visualize the major portion of the gastric stump. Repeated gastroscopic examinations can certainly contribute toward the early recognition of malignancy. Quarterly gastroscopy, however, seems radical. An annual or, at most, semiannual examination should suffice. Several factors with regard to gastric malignancy are in this patient's favor. First, the patient and the clinician are alerted to the potential development of malignancy. Second, those malignancies developing in the atrophic stomach have a relatively good prognosis because they tend to begin as localized polypoid lesions. Early diagnosis is possible by several methods, the most promising being gastric cytology, which is as accurate as the roentgenographic and gastroscopic examinations, is well tolerated by the patient, and carries no risk. Furthermore, polypoid malignancy lends itself to a successful surgical excision. This patient can be strongly reassured on the basis of these facts. The use of four diagnostic aids (examination of the feces for occult blood, gastric cytology, gastroscopy, and x-ray) should reassure the physician. The after-effects and operative mortality of total gastrectomy are similar to those of partial gastrectomy but greater. The operative mortality is at least 15% and may be much higher. The morbidity, however, is high: nutrition problems, anemia, inability to maintain weight, diminished intake of food, abdominal pain, and diarrhea. In short, the operation contemplated is not indicated. It would be prophylaxis carried to the point of absurdity.

RADIOACTIVE GOLD (Au^{199})

TO THE EDITOR:—*What is the present status of, indications for, and results from the use of radioactive gold for the treatment of ovarian cancer? Where can one obtain this agent?*

D. D. Dieter, M.D., Eustis, Fla.

ANSWER.—Radioactive gold (Au^{199}), a radioactive isotope of gold, is available through the Medical Division of Atomic Energy Commission, Oak Ridge, Tenn., only to those who are registered as being qualified in the handling of radioactive materials. Such special equipment as gloves and syringes is required in the handling of this isotope because of the high gamma component. Its use carries a high incidence of complications, particularly adhesions and intestinal fistula (local injury). Special isolation room and nursing care is indicated because of the danger to those providing the nursing

care as well as to other patients. The indications are chiefly palliative control of ascites and implants less than 8 mm. in diameter. The use of radioactive colloidal chromic phosphate (P^{32}) instead of radioactive gold is suggested.

POSTMENOPAUSAL BLEEDING

TO THE EDITOR:—*Is it possible for a 62-year-old woman, who went through the menopause at the age of 45 and who has had no menstrual bleeding since that time, to have menstrual bleeding? This bleeding occurred after an automobile accident in which she was severely shaken up but did not sustain direct injury to the pelvis or lower abdomen. It persisted despite dilatation and curettage, so that a hysterectomy was necessary. Would the bleeding be entirely based on, or the result of, the accident and not due to some other cause?*

Dexter T. Ball, M.D., Santa Ana, Calif.

ANSWER.—An adequate answer to this question would necessitate more information as to the time sequence of the accident and the bleeding, as well as to the histopathological picture of the curettage and hysterectomy specimens. Bleeding may occur after menopause from a variety of conditions. Among these are a persistent estrogenic endometrium, endometrial and endocervical polyps, carcinoma of the cervix or endometrium, hormone therapy, occasionally submucous myomata, and, in hypertensive women, occasionally atrophic endometrium. Consideration should be given to the fact that the stress of the accident may have upset hormonal balances so that bleeding may have resulted. Several investigators, including Davis and co-workers (*J. Clin. Endocrinol.* 12:697, 1952), Forsham and associates (*J. Clin. Endocrinol.* 8:15, 1948), and Farnsworth (in *Proceedings of the First Clinical ACTH Conference*, edited by J. R. Mote, Philadelphia, the Blakiston Company, 1950, pp. 297-317), have reported menstruation, in patients who previously had amenorrhea, after ACTH administration, and others, including Jones and co-workers (*Fertil. & Steril.* 4:49, 1953) and Greenblatt (*Am. J. Obst. & Gynec.* 66:700, 1953), have demonstrated that cortisone therapy administered to women with amenorrhea has been followed by menstruation. The alteration of menstrual function under severe emotional or physical trauma has long been noted in the premenopausal period, and a definite relationship between hypothalamus, ACTH, corticosteroids, and menstrual bleeding apparently does exist. However, there is no supporting evidence that this same mechanism does or can take place after the menopause. Bleeding severe enough to necessitate a hysterectomy would lead one to guess that the bleeding was due to some vascular

disorder which may or may not have been conditioned by the hormonal changes accompanying the stress of the accident. Functional bleeding of this severity may occur, but it is highly unlikely after the menopause.

AMBLYOPIA EX ANOPSIA

TO THE EDITOR:—In reading the answers supplied by the consultant regarding amblyopia ex anopsia in *THE JOURNAL*, Nov. 22, 1958, page 1732, I was amazed by the statement, "Glasses are prescribed for one purpose only, and that is to improve the visual acuity. There is no therapeutic value in wearing glasses." This is certainly a misleading statement. There are several reasons for prescribing glasses besides improving visual acuity, one of the most common being for comfort. The therapeutic value of glasses, although not common, is certainly well recognized in accommodating esotropias, in which glasses completely straighten the eyes. In some patients anisometropia, in which the hyperopia is more than 2 diopters greater in one eye, is one of the reasons for so-called amblyopia ex anopsia. If this is diagnosed before the age of 3 or 4 years and glasses prescribed to correct the difference between the two eyes, the amblyopia can be prevented or cured. Sometimes a patch over the stronger eye is necessary.

Dan A. Russell Jr., M.D.
429-433 Medical Arts Bldg.
San Antonio 5, Texas.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

TO THE EDITOR:—The patient under discussion had amblyopia ex anopsia. Vision at 13 years of age was 20/50 in the right eye and 20/15 in the left eye. There was no pathology, no strabismus, and no discomfort. Although the refractive status of the eyes was not stated, it was presumed that the earlier ophthalmological examinations revealed that the visual acuity of the right eye could not be improved by the use of glasses. There was no discomfort to be relieved. The statement that "there is no therapeutic value in the wearing of glasses" is pertinent in the case under discussion and is the answer to the original question. Glasses that have a refraction value to improve visual acuity are helpful in treating ocular imbalance, give relief of symptoms of eye strain, and in several ways are of therapeutic value. However, if the visual acuity is not improved, a neutral, blank, or even tinted plain glass in a spectacle frame will have a psychological effect—the treatment is social, not scientific. To the question here of whether proper glasses will "do anything to check the loss or even improve the vision," the answer is no.

PAGET'S DISEASE (OSTEITIS DEFORMANS)

TO THE EDITOR:—The question on treatment of Paget's disease (osteitis deformans), which appeared in *THE JOURNAL*, Aug. 9, 1958, page 1904, was competently answered. However, in a similar case in a 60-year-old woman, a physician has strictly objected to the drug recommended by the consultant. Is agranulocytosis or impaired liver function to be thought of despite the small doses of phenylbutazone advised? To add to the patient's pain and discomfort by telling her that nothing can be done would be to inflict severe psychic trauma—a classic example of iatrogenesis. This patient feared a pathological fracture. The deformity of her leg was slight four years ago but has progressed to merit the designation of osteitis deformans. If, four years ago, some sort of orthopedic appliance, elastic stockings, or elastic bandages had been used, would not the patient have derived some benefit in lessening the pain and deformity? Even at this stage, may some sort of an appliance be prescribed for her that would offer some comfort?

Meyer Golob, M.D.
3427 S.W. 26th St.
Miami 33, Fla.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

TO THE EDITOR:—Many cases of deformity due to osteitis deformans, including marked bowing of the tibias or femurs, have been seen by this consultant. No instance of spontaneous fracture of any of the major bones has been observed. When fracture has occurred as the result of trauma, healing has been delayed but union has usually resulted. The use of elastic bandages or elastic stockings for a condition which affects the bones, primarily, is of no value. If the bowing is marked or is definitely increasing, consideration should be given a long-leg type of brace with ischial weight-bearing or with a leather-laced cuff for the thigh so that the weight will be distributed to a level proximal to the site of strain on the affected bones. This consultant has not read of any case of agranulocytosis which resulted from doses of phenylbutazone of less than 200 mg. per day. In spite of that fact, it is advisable to have a blood cell count, including hemoglobin and differential, every two or three weeks while the patient is taking this drug.

CORAL SNAKE BITES

TO THE EDITOR:—Many snake bites, both poisonous and nonpoisonous, are seen in the Southwest, but considering the number of coral snakes in this area the rarity of the bite is odd. A patient was seen recently who received a coral snake bite through the seat of his pants. His symptoms were

restricted to weakness, which became profound in the ensuing two weeks. The weakness continued for many months, but eventually the patient completely recovered. How much of the weakness was pathological and how much psychological is unknown. Treatment in addition to that outlined in *THE JOURNAL*, Nov. 8, 1958, page 1425, included large amounts of vitamins by injection. Vitamin B₆ apparently was of help.

C. R. Queen, M.D.
113 S. 10th St.
Edinburg, Texas.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

TO THE EDITOR:—Muscular weakness and paralysis are not uncommon in severe coral snake venom poisoning. The venom of coral snakes is primarily a neurotoxin. Brazil and Barrio pointed out the curare-like effects of *Micrurus* venoms (*Prensa méd. argent.* 37:1249, 1950). The prolonged period of muscular weakness in the case described suggests neurological damage. Although vitamin B₆ has been used, with equivocal results, in the treatment of diseases characterized by muscular weakness, no experimental or clinical studies have shown its efficacy in the treatment of coral snake envenomation.

TREATMENT OF SNAKE BITE

TO THE EDITOR:—In the *JOURNAL*, Oct. 18, 1958, page 980, a question was asked on the treatment of snake bite. There have been so many short articles and so much conflicting information on the treatment of snake bite that one more communication would seem somewhat superfluous. Nevertheless, some of the recommendations that were given are open to some criticism: There is no criticism concerning the recommended inactivity, since exercise will facilitate distribution of the poison. By the same token, the use of epinephrine (suggested in the fourth recommendation) cannot be condoned. Epinephrine, in addition to being an effective pressor agent, has the same disadvantage that exercise has, in that it produces tachycardia, one of the things to be guarded against. In place of epinephrine, several of the newer pressor drugs can be recommended. For emergency use, to be carried about in a physician's bag, there is methoxamine hydrochloride. This drug can be given intramuscularly or intravenously, is an effective pressor agent, and does not produce tachycardia. On the contrary, it produces a bradycardia which should be desirable. — A second drug, similar to methoxamine, is mephentermine. This also can be given intramuscularly or intravenously. For hospital use there is

nothing to equal levarterenol. This drug must be given intravenously. These three drugs will slow absorption of the venom by the peripheral vasoconstriction they produce. They are also useful in treating shock, if this should occur.

No criticism can be directed toward the statements concerning the use of antivenin and the tourniquet. The same can be said concerning the advantages of ACTH and/or adrenal steroids. Both are useful adjunctive treatment. One would agree with the statement that tetanus antitoxin and antibiotics are indicated. Similarly, cryotherapy, as advised years ago by Dr. Frederick M. Allen, should be used by applying ice cubes to the bitten part, usually an extremity, while the patient is awaiting transportation to the hospital. Exception can be taken to one statement in the answer which concerns the availability of coral antivenin. The statement is made that "there is no antivenin available in this country against the coral snake." This statement may have been true a year or two ago, but it is not true today. In Florida alone a supply of coral snake antivenin is currently available in Tampa (fire department); at Mound Park Hospital, St. Petersburg; and the Hollywood (Fla.) Memorial Hospital. This antivenin is made from cobra venom, since it is difficult or impossible to persuade the coral snake itself to yield a supply of venom large enough for the purpose. Both are neurotoxic, so that cobra antitoxin can be used to treat coral snake bites. Incidentally, I am aware of only one source of supply of this preparation, the South African Institute for Medical Research in Johannesburg, South Africa. There may be others.

Another statement, "The trend is definitely away from incision and suction," is open to criticism. I am not aware of any trend away from either one. Incision and suction work hand in hand with the tourniquet by tending to pull out of the tissues the venom which is being "pushed out" by the passive hyperemia produced by the proper application of the tourniquet. Finally, the use of a tourniquet in coral snake bite is controversial. Some authorities, like Ross Allen, say that it should not be used. My own feeling is that it should be used so tightly as to isolate completely the bitten extremity from the rest of the body. This is in contradistinction to the manner in which the tourniquet should be used in cases of bites by snakes of the *Crotalidae* family (rattlesnake, water moccasin, and copperhead). In these cases, the tourniquet is applied tightly enough to occlude both lymphatic and venous outflow from the limbs but not tightly enough to occlude arterial inflow.

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THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees



VOL. 169, NO. 8

CHICAGO, ILLINOIS

FEBRUARY 21, 1959

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CARCINOMA OF THE LARYNX

RESULTS OBTAINED BY SURGERY AND EXTERNAL RADIATION IN NINETY-THREE CASES

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and

John R. Lindsay, M.D., Chicago

NINETY-THREE cases of carcinoma of the larynx treated before Dec. 31, 1952, are the subject of this review. The observation period was a minimum of five years except for those patients who died and those who were lost to follow-up. The latter amount to 3%. When it has been impossible to trace the patient, it has been presumed that he or she died of the disease. The report comprises all patients treated, including those who received only palliation.

These 93 cases have been classified and staged in accordance with the methods suggested by the international committee for stage-grouping in cancer and for the presentation of the results of treatment of cancer (referred to as ICPR)¹ in Copenhagen in July, 1953, with only one minor modification. Classification of the anatomic sites of carcinoma of the larynx are the supraglottis, glottis (vocal cords), subglottis, and borderline areas.

The lesions occurring in the borderline area "arise at or near the upper border of the larynx in which on examination it is impossible to state accurately whether the original lesion began within or without the larynx. Such lesions should be in-

Factors that might affect the prognosis in carcinoma of the larynx have been studied in 93 patients treated not less than five years ago. The patients were classified with respect to both the stage of the disease and the location of the lesion. These factors to some extent influenced the choice of treatment, which was either by surgery or by radiation. (Supervoltage was not used in this series.) Comparisons were therefore difficult. In 65 of the 93 cases the lesion was at the glottis, and 37 of the 65 glottic lesions were classified as stage 2 (carcinoma infiltrating but not extending beyond larynx, mobility of larynx impaired or lost, no nodes palpable). Of the 37, 25 (68%) survived five years or more. On the basis of experience with glottic lesions in stage 1 and early stage 2 it is concluded that this group may safely be treated primarily by external radiation, provided that a careful follow-up can be assured.

From the Section of Otolaryngology and the Department of Radiology, University of Chicago.

Read before the Section on Laryngology, Otology, and Rhinology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

cluded with the pharyngeal carcinoma.”¹ Lederman,² giving sound reasons, has suggested that the epiglottis be divided into infrahyoid and suprahyoid portions; growths involving the suprahyoid portion

TABLE 1.—*Survival Rates in Carcinoma of Larynx According to Classification*

Classification	No. of Cases	5-Yr. Survival	
		No.	%
Supraglottic	27	10	37
Glottic	65	43	66
Subglottic	1	1	100
Totals	93	54	59

should be considered epilaryngeal tumors of the pharynx. Thus the supraglottic area includes the ventricle, ventricular fold, and infrahyoid portion of the epiglottis. This puts a more definite limit to the supraglottic area and should reduce the number of cases being placed in the borderline group. Clinical stages in carcinoma of the supraglottis, glottis, and subglottis (ICPR) are stage 1, carcinoma limited to the mucous membrane, full mobility of the larynx retained, no nodes palpable; stage 2, carcinoma infiltrating but not extending beyond larynx, mobility of larynx impaired or lost, no nodes palpable; stage 3, carcinoma extending beyond larynx, or nodes palpable but movable; and stage 4, involvement of skin, or nodes fixed, or distant metastases present.

In this series surgery has consisted of biopsy excision, laryngofissure, laryngectomy, and radical neck dissection of metastatic nodes. In only one case was biopsy excision performed, and this gave five years' freedom from disease before recurrence appeared. The only other conservative procedure used was laryngofissure; hemilaryngectomy and other modifications were not performed. Prophylactic neck dissection had not been employed up to December, 1952. In those patients with neck metastases, the dissection was performed along with the laryngectomy; in only one case was it deemed necessary to perform bilateral neck dissection as primary treatment, and the second side was dissected three weeks after the first operation.

Radiation

Since early in 1953, it has been our practice to use supervoltage radiation and more than 30 patients have been so treated. Our impression is that the long-term results may be slightly better. Furthermore, there is less skin reaction and less difficult surgery when radiation fails. Mucositis is equally severe and, of course, has to be; otherwise, it is obvious that not enough treatment has been given or that the rate of administration has been too slow. The dose is about 6,000 r to the tumor in 42 days with 2 Mev.

The method of treatment at 250 kv., as used in the discussed cases, was with bilateral directly opposed fields which ranged in size from 4 by cm.

to as large as 6 by 8 cm., depending on the extent of the lesion. The smallest field possible was used, and in the later years plaster jackets were used along with special devices for accurately aiming the beam of radiation. More important was the making of films to demonstrate the location of the treatment portal. The earlier patients were treated lying down, but as the special devices came to be used the patients were seated in a special chair which gave better immobilization and day-to-day accuracy. Most of the later patients received a more standardized treatment consisting of a tumor dose of 5,000 to 5,500 r in 35 to 42 days. This dose falls within the range of time-dose relationship found to be best by other workers.³ The radiation was at first 200 kv., half-value layer 1.5 mm. Cu; but since 1950 we have used 250 kv., half-value layer 3 mm. Cu. Treatment distance was 50 cm. in most cases, but occasionally for individuals with very thick necks 80 cm. was employed. Skin reactions were severe as would be expected, and most patients developed a wet dermatitis.

During treatment the patients were carefully observed by both radiotherapist and otolaryngologist and followed at frequent intervals thereafter by both services. The joint management of these cases has been found to be a distinct advantage for all concerned.

Results

As can be seen in table 1, 70% of the lesions originated in the vocal cords and 29% in the supraglottic area. There was only one subglottic case which was in stage 2 when laryngectomy was done. It will be noted that the over-all five-year survival rate in the supraglottic group is 37% and in the glottic 65%.

In table 2, it is seen that more than 60% of the supraglottic cases were in stage 3 when diagnosed and there were no stage 1 cases, confirming the view that many patients with supraglottic lesions are asymptomatic for a long period, unlike those patients with glottic lesions where hoarseness is a complaint relatively early. The 37% over-all five-year survival rate is made up of 4 survivals out of 9 stage-2 cases, 6 out of 16 stage-3 cases, and none out of 2 stage-4 cases.

TABLE 2.—*Survival Rates in Supraglottic Carcinoma of Larynx According to Stage*

Stage	No. of Cases	5-Yr. Survival	
		No.	%
1.....	0	0	0
2.....	9	4	44
3.....	16	6	38
4.....	2	0	0

Table 3 shows that surgery as the primary form of treatment gave superior results in stage-2 supraglottic lesions. The two patients who failed to respond to radiation were later subjected to laryngectomy and one of them survived five years. Again

in stage-3 supraglottic lesions it would appear that surgery offers a better chance of five-year survival than does radiation. Those patients who had primary radiation were later subjected to surgery.

TABLE 3.—Survival Rates in Supraglottic Carcinoma of Larynx According to Therapy

Treatment	Stage 2			Stage 3		
	No. of Cases	5-Yr. Survival		No. of Cases	5-Yr. Survival	
		No.	%		No.	%
Surgery	4	3	75	4	2	50
Radiation	5	0	0	11	2	18
Radiation failure	(2)	1	50	(3)	1	33
Radiation failure elsewhere				1	1	100
Total	9	4	44	16	6	38

Included in the table is one patient who had received radiotherapy at another institution. The two patients with stage-4 supraglottic lesions failed to live one year.

Whereas surgery gave a five-year survival rate of 80% in glottic stage 1, radiation as primary form of treatment only achieved 70%, but one of the failures was salvaged by surgery, bringing the percentage of five-year survival up to 80% for the 20 cases in this group. In this small number of cases, however, there is no practical difference between the results obtained by primary surgery and primary radiation (table 4).

On examining the results obtained by surgery and radiation in glottic stage 2 we find that primary surgery gives a slightly better five-year survival rate than radiation does. However, if the four cases which were salvaged by surgery after failing radiation are added to the seven radiation five-year survivals, we find that 78% of patients receiving primary radiation gain five years free of cancer.

The relatively low five-year survival rate with surgery is accounted for by the policy that has been practiced in the University of Chicago Clinics, namely, many of the patients with early stage-2 cases (those with diminution of movement of cords) are treated by primary radiation, whereas those with definitely fixed cords are subjected to laryngectomy. The survivals obtained would suggest that nothing is lost by this policy and that many patients avoid the mutilation of laryngectomy while others retain the larynx for a few years before coming to surgery.

Included in the stage-2 glottic group are five patients who had failed to respond to radiation elsewhere. Obviously it is impossible to satisfactorily classify and stage these patients after treatment has been given. However, there was no choice but to view them as presenting for treatment for the first time. It is seen that three out of five gained a "cure."

In glottic stage-3 cases, it is noted that surgery gave a better five-year survival than radiation. One patient with stage-4 glottic lesions survived five years after radiation followed by surgery.

Comment

Although each of the groups of cases is small and unsuitable for statistical analysis, certain impressions have been gained as to the place of surgery and radiation as primary forms of treatment in carcinoma of the larynx.

In the supraglottic group of cases radiation did not appear to offer as good a chance of five-year survival as surgery, even though some failed radiation cases can be salvaged by delayed surgery. The cure rate of the combined therapy was considerably lower than when primary surgery had been carried out.

This is not surprising when we consider that Bocca⁴ found in 500 cases of laryngeal cancer that the incidence of cervical metastases was 51% in supraglottic lesions. Ogura and Bello⁵ found that, out of 18 prophylactic neck dissections, in seven cases there was histologically demonstrable involvement of the lymphatics, in five other cases laryngectomy with radical neck dissection was performed after external radiation, and tumor was found in the nodes on three occasions.

There is, therefore, a high incidence of cervical metastases in these supraglottic lesions, and, furthermore, the involvement of these nodes may not be clinically detectable. Most clinicians are agreed that external radiation has little effect on cervical metastases.

It is, therefore, not surprising that external radiation as a primary form of treatment is not likely to be successful in the supraglottic lesions except in the very early stages. A similar argument can be put forward for surgery as the choice of treatment in all but early subglottic lesions.

It is apparent from the figures presented and from the work of others that there is little difference in the results obtained by surgery and radiation in the stage-1 glottic lesions. The average figure for five-year survival in the group is about 85% whether treatment is by surgery or by radiation.*

TABLE 4.—Survival Rates in Glottic Carcinoma of Larynx According to Therapy*

Treatment	Stage 1			Stage 2			Stage 3		
	No. of Cases	5-Yr. Survival		No. of Cases	5-Yr. Survival		No. of Cases	5-Yr. Survival	
		No.	%		No.	%		No.	%
Surgery	10	8	80	19	11	58	2	1	50
Radiation	10	7	70	13	7	54	5	0	0
Radiation failure... ..	(2)	1	50	(5)	4	80			
Radiation failure elsewhere				5	3	60			
Total	20	16	80	37	23	62	7	1	16

* One patient in stage 4 survived five years after radiation followed by surgery.

Primary radiation therapy in stage-1 lesions has the advantage of preserving a better voice and, furthermore, lesions can still be subjected to surgery before the disease has progressed beyond stage 1 or early stage 2.

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		No.	%		No.	%		No.	%
Surgery	10	8	80	19	11	58	2	1	50
Radiation	10	7	70	13	7	54	5	0	0
Radiation failure...	(2)	1	50	(5)	4	80	—	—	—
Radiation failure elsewhere	—	—	—	5	3	60	—	—	—
Total	20	16	80	37	25	68	7	1	16

^a One patient in stage 4 survived five years after radiation followed by surgery.

Primary radiation therapy in stage-1 lesions has the advantage of preserving a better voice and, furthermore, lesions can still be subjected to surgery before the disease has progressed beyond stage 1 or early stage 2.

There is a difference, however, between the two forms of treatment when applied to glottic stage-2 cases where the choice lies between radiation and laryngectomy rather than a conservative surgical procedure. Surgery gives a better five-year survival rate. Our surgical five-year survival figure is lower than it was three years ago. This undoubtedly results from the type of case treated. Only those with fixed cords have been subjected to primary surgery (laryngectomy) whereas those cases in which the cord movement was diminished but the cord not fixed—what might be termed early stage 2—have been subjected to radiation. Though the primary radiation five-year survival may be worse, when the cases salvaged by operation are added the survival figure equals that obtained when operation is the primary form of treatment.

By subjecting the patients with early stage-2 cases to radiation first and reserving operation for case of need, in some the mutilation of laryngectomy has been avoided and in others the larynx has been preserved for a number of years before operation is necessary. This form of therapy demands a most careful follow-up to insure that residual tumor or a recurrence be detected early.

On the basis of these findings the following principles of treatment would appear to be warranted: Patients with supraglottic and subglottic lesions

should be subjected to primary surgery except those in stage 1. This operation should include bilateral neck dissection. We feel that stage-1 cases should be offered external radiation as primary treatment. Patients with stage-1 and early stage-2 glottic lesions should be treated primarily by external radiation, provided that a careful follow-up can be assured. Operation should be used in late stages 2, 3, and 4. Bilateral neck dissections should be used in stages 3 and 4 or where there is evidence of subglottic or supraglottic extension.

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ESSENTIAL MEDICAL SUPERVISION IN ATHLETICS FOR CHILDREN

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Essential medical supervision of children in sports consists of making sure that the child is fit for the sport in which he or she is to participate and of seeing that the child remains fit during the period of participation. The School Health Committee of the State Medical Society of Wisconsin¹ has expressed it succinctly: "careful medical evaluation prior to athletic participation, with continued medical supervision and guidance during the training and competition." The amount of medical supervision and guidance required depends on the type of athletic program in use. In general the

¹Read in the Symposium on Competitive Athletics in Children before the Joint Meeting of the Section on Pediatrics and the Section on Preventive Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

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The physician called on to judge a child's readiness for a given form of athletics must understand both the sport and the child. Certain contact sports, especially when competition is intense, are too severe for immature boys. Puberty is one criterion for maturity, but the best basis for advice regarding participation in sports is examination by the physician, in his office, at regular intervals from infancy. On this basis the physician can do much to insure the proper choice of sports and to protect the child from injury and exploitation. Cooperation between physician and coach is important to this end.

more highly competitive the program and the more body contact involved, the more urgently is medical supervision needed.

The need for and value of preparticipation examinations seem obvious. Often such examinations are made by several physicians in assembly-line fashion. In many instances this is considered the only way they can be carried out. This type of appraisal is better than none, yet it can scarcely be termed "careful medical evaluation." The physician in his office can better evaluate a child's readiness for a sport. In fact, the physician's best basis for advice regarding participation in sports is examination at regular intervals from infancy.

The physician should try to assess the child's physiological maturity so that he can help decide whether the youngster will be able to hold his own in the proposed sport. No accurate test or measure is available for this purpose, but rough estimates can readily be made. With high school boys the degree of development of pubic hair is often a helpful indication.² Children who are obviously immature should not be allowed to compete against the more mature, regardless of the equality of their ages. Age and weight are of some value in determining equality of competition, but a maturing youngster 12 or 13 years of age may outperform a less mature 14-year-old, even though the two are of equal weight.

Children who are poorly coordinated or physically handicapped in other ways should be encouraged to participate in athletic programs commensurate with their abilities, in which they should compete with others of approximately equal ability. The physician's responsibility is to advise the coach or physical director of the activities in which such a child may be allowed to participate.

Tests of the degree of conditioning may be of some value if properly used. They will probably be found to be most helpful among those who are in the more highly competitive sports in senior high school, but they may be used for younger children as well. The step test³ is perhaps the simplest and best to use. Of course, athletic activities should not so engage the time and energy of a child that he is not fit for other activity.

Injuries occur in sports, most often in those involving contact. It is the duty of the physician to understand the dangers of the sport so that he may counsel the child and his parents regarding participation. This does not mean that a protective shield is to be thrown around the children of America, but it does mean that if enjoyment and development of skill and physique can be provided by two sports programs in equal degree, the one attended with fewer injuries is the more desirable. However, as has been pointed out by others,⁴ "All life is risk and without courage life

is not worth living." It is desirable for a high school boy capable of taking part in a well-conducted program of football⁵ or other sports to do so in spite of some calculated risk. A fractured bone may leave less of a scar than a personality frustrated by parental timidity over allowing a boy to take part in a contact sport. Certain contact sports combined with intense competition, however, are too severe for immature boys.

Survey of Literature

There is remarkably little factual material published on the injury rate among children engaged in various sports. Studies such as those Thorndike⁶ has made of Harvard football players, McPhee⁷ of Princeton players, and Condon⁸ of Boston College athletes should be carried out among high school, junior high, and younger players. Some information on high school players was obtained in 1949 by a three-state study in Minnesota, Wisconsin, and Michigan.⁹ Another study, by Hibbert,¹⁰ disclosed that one of five participants in football sustained an injury and that of those injured one in five (one of every 25 engaged) had a fracture. Both these studies show that the greener the lad, the higher the percentage of injury. The highest injury rate is among those less than 18 years of age.

Some effort is being made to collect data on the children who play football in the various Pop Warner Football Leagues.¹¹ The data thus far available indicate that most of the more severe injuries are fractures or epiphyseal separations. Other studies on children have been carried out, but the results are in unpublished theses and in journals not available to most physicians. As more states adopt insurance schemes to cover high school athletes, additional information will be collected for study. This, however, will represent only the more severe injuries of adolescents and postadolescents. The lesser injuries also should be tabulated. Lowman,¹² indeed, has stressed the incipient injury, "the minute day-after-day trauma of the growing skeleton," the results of which may not be evident for several years. It is obvious that this type of injury will continue to be difficult to recognize and evaluate.

Recently the effect of exertion and sport activity on renal function has been studied.¹³ It was thought initially that the hematuria observed among football players was due to the contact nature of the sport. The Duke study, however, demonstrates that it can occur among swimmers also. The extent to which hematuria occurs among elementary school athletes has never been studied, nor has the significance of exertionally induced hematuria been determined. Does transient hematuria mean renal damage, or does it indicate only a transient aberration of function?

Although football, as the most widely played contact sport in this country, has been the one most widely investigated, the injuries which occur in other sports such as baseball, track, lacrosse, soccer, ice hockey, basketball, and wrestling should be studied also. A report regarding the injuries sustained by those participating in Little League baseball is soon to be published.¹⁴ Much other work remains to be done, particularly among children of junior high and upper primary school age. Injuries among these groups remain among the unknowns of competitive athletics for children.

Those who have written about injuries sustained through participation in athletics have correctly pointed out the need for medical supervision of injuries incurred not only during the games but also during practice sessions. While this extension of supervision may be difficult, if not impossible, for many senior high school, junior high school, and elementary school athletic teams, it nevertheless is a goal toward which we should aim. Both Thorndike⁶ and Reichert¹⁵ have pointed out that the eager competitor often tries to hide an early injury. Failure to detect and treat early injury results frequently in prolonged convalescence or permanent injury.

Intercurrent infections, respiratory infections, gastrointestinal upsets, and contagious diseases strike the athlete as well as the nonathlete. It is the duty of the physician and not the coach to decide when the boy who has had either an injury or an illness may return to playing. Ample opportunity particularly should be allowed for the child to recover fully after a streptococcal infection.¹⁶

Most articles concerned with children's athletic activities concern boys alone. Girls also take part in athletics, and they also need medical supervision. Customarily their sports activities are less strenuous and less intensively competitive than boys' sports, and they seldom engage in body contact sports. Preparticipation examination, however, is important for girls as well as for boys. Furthermore, the physician may be asked to decide on the suitability of certain sports for girls.

Professional Responsibilities

Many of us in medicine are sports fans, and some of us are still players. Yet we should not allow our sports enthusiasm to overpower the need to keep athletic programs in proper perspective. As physicians, we must remember that while an athlete must be fit to be a good competitor, competitive athletics are better viewed as a means of keeping fit. Athletics should be a means to an end, not an end in themselves. A few children are endowed with the mental and physical abilities which make

a great athlete. Such a child, like the intellectually gifted child, must be guided properly so that he makes the most of his abilities. He must not be exploited.

Joint meetings of doctors and physical educators, such as the Indiana Conference of Physicians and Coaches in 1957,¹⁷ are very valuable. Cooperation between doctors and physical educators locally and between organizations of each group at state and national levels will do much to insure the proper choice of sports for children of the various age groups, proper matching of adolescents and children in competition, adequate medical supervision, and a better program of fitness for the youth of our country.

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ROLE OF EXFOLIATIVE CYTOLOGY IN THE DIAGNOSIS OF CANCER OF THE DIGESTIVE TRACT

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Sufficient time has elapsed to permit critical evaluation of the diagnostic possibilities of exfoliative cytology in cancer of the gastrointestinal tract. The purpose of this paper is to present the results obtained with this technique in the four major areas, namely the esophagus, the stomach, the pancreas and biliary systems, and the colon. The technical aspects consist of a succession of simple steps and techniques performed systematically, as previously described.¹ Discrepancies in the routine of collection or in interpretation will reduce the value of the examination. Exfoliative cytology, when properly used, ranks second only to direct biopsy of the lesion in accuracy and reliability in the diagnosis of cancer.

Major Areas

Esophagus.—The esophagus is the easiest and most direct organ to study cytologically² and yields the highest percentage of correct positive diagnoses. Of 151 patients examined, 69 had esophageal carcinoma; in 66 of these (95%) a diagnosis of malignancy was established preoperatively. The roentgenologic examination was strongly suggestive or diagnostic of carcinoma in 55 of the 69 cases. Of the 82 patients without cancer, the results of the cytological examination were negative in 80 and false-positive in 2.

Rarely are basal cell or epidermoid (squamous cell) carcinomas difficult to diagnose. In one of three patients with cancer in whom the diagnosis was not established cytologically, the x-ray examination disclosed a midesophageal stricture. Extremely well differentiated malignant cells were seen in the lavage but were not recognized as such until compared with cells obtained at the postmortem scraping of the lesion. The second false-negative result was of an adenocarcinoma of the distal one-third of the esophagus from which several cells suggestive of malignancy were obtained; the patient was recalled for a reexamination but experienced a myocardial infarction before he could return. The third false-negative diagnosis was of a squamous cell neoplasm which apparently failed to penetrate the mucosal surface and hence did not exfoliate malignant cells. Esophagitis with leukoplakia has been the only disease which has produced a prob-

The diagnostic method of exfoliative cytology has been applied to lesions in the esophagus, stomach, duodenum, pancreas, bile ducts, and colon. The present study concerns the frequency with which the diagnosis of cancer, confirmed by subsequent findings, was anticipated by microscopic examination of cells obtained by lavage. The most difficult area was the duodenum, but malignant cells were recognized in 33 out of 55 cases in which cancer was primary or metastatic in the duodenum or existed in the pancreas or biliary system. In 95% of a large number of cases of cancer of the esophagus, stomach, and colon the results of exfoliative cytology were positive. False-positive results were infrequent with reference to esophagus, stomach, and duodenum and did not occur with reference to the colon. In 38 proved cases of cancer of the colon, cytological diagnosis was positive in 36 instances.

lem in interpretation. In two patients with this disease, one with cardiospasm, malignant-appearing but nevertheless benign cells were exfoliated in small numbers and falsely interpreted as malignant.

Stomach.—The stomach is the most frequently examined organ. We have studied 871 patients since April, 1955, 131 of whom were eventually proved to have gastric adenocarcinoma³ or lymphoma.⁴ A correct cytological preoperative diagnosis was made in 125 of the 131 patients (95%). Of the 740 patients without cancer, the results of the cytological examination were negative in 736, false-positive in 4.

Pathognomonic cells were found in all seven cases of lymphosarcoma; reticulum cell sarcomas were recognized in two of the three patients. One leiomyosarcoma did not exfoliate pathognomonic cells. It is important to note that satisfactory examinations were performed in all but 10 of the 871 cases. Obstruction and retention due to duodenal ulcer was the most frequent cause of an inadequate examination.

Benign gastric ulcer in the healing phase occasionally exfoliates an interesting and confusing cell whose increase in size and chromatin condensation is suggestive of malignancy. We have looked on these abnormal atypical cells, perhaps naively, as

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Read before the Section on Gastroenterology and Proctology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 24, 1958.

the mucosa's attempt to breach the ulcer defect with immature columnar cells. In treated pernicious anemia² the gastric mucosa exfoliates a macrocytic bland columnar epithelial cell; during relapse a bizarre cell indistinguishable from gastric cancer is often found. Mucinous goblet cells are seen with atrophic gastritis (colonization of the mucosa), with benign gastric polyps, and occasionally with gastric cancer. After irradiation, the stomach will exfoliate for several weeks a large number of cells with many morphologic features of malignancy. In the single instance of a benign papilloma encountered, interesting "tumor cells" were obtained which lacked the typical nuclear clumping of malignancy. Benign granulomas may exfoliate multinucleate histiocytic giant cells, but benign leiomyomas do not slough characteristic cells.

We failed to diagnose 6 of 131 adenocarcinomas and sarcomas of the stomach; these are recorded as false-negative examinations. The most likely causes for failure seem to have been improper positioning of the gastric tube, inability to identify a few malignant cells, reepithelialization of a malignant ulcer base (two cases), and failure of a minute submucosal carcinoma to penetrate the surface. Of 740 patients with benign gastric conditions only 4 (0.5%) were given an erroneous cytological diagnosis of malignancy (false-positive report); in all four instances, pathological processes in the stomach or duodenum were found at surgery. In three of these patients healing duodenal ulcers apparently exfoliated small numbers of malignant appearing cells which entered the stomach by reflux during the gastric lavage. Scant information is available on the exfoliation of healing duodenal ulcers; it is interesting that, in our experience, this is the most common cause of misinterpretation. In the fourth patient, multiple shallow healing ulcers of the lesser curvature of the stomach were present, which on histological examination were found to contain the same abnormal prototype cell observed in the gastric wash.

A comparison of the accuracy of cytological diagnosis with the roentgenologic interpretations is of considerable clinical importance.

TABLE 1.—X-ray versus Cytological Diagnosis in 131 Cases of Gastric Cancer

	X-ray		Cytological	
	No.	%	No.	%
Cancer	81	61	125	95
Inconclusive	27	20	0	0
No cancer	23	19	6	6

In the 131 proved malignancies, the x-ray report was definitely positive in 81 cases (61%). In the remaining 50 patients, (39%), the x-ray examination was reported as normal in 23 and as benign or questionably benign in 7 with ulcers and in 20 with miscellaneous conditions. Malignant cells were recovered by lavage in all 27 of these patients. It is

evident that the diagnostic accuracy of the technique of exfoliative cytology is higher than that of x-ray examination, but it must be admitted at the same time that the procedure cannot be used for large-scale screening because of the time required for examination. Hence, in a sense, the two methods are complementary and additive; since the x-ray examination is easier, the cytological study may be held in reserve to be used when more precise information is needed.

It always has been our opinion that a report of "atypical cells," or "grade III or IV" contributes to confusion. We report only "positive for malignant cells" or "negative for malignant cells." If abnormal or unidentifiable cells appear in a gastric wash we repeat the examination with a most vigorous lavage. This second wash will almost always resolve the issue. In all cytologically positive cases, we have found some malignant cells on the first wash; when few in number or not well preserved a second lavage has produced abundant neoplastic cells. Similarly, our experience has been that, when one is not quite certain of the origin of atypical cells, a second wash will often yield additional cells readily recognized as benign. Thus a majority of the problems can be resolved with a second lavage.

Pancreatic and Biliary Systems.—The pancreas and biliary tract have been the most challenging and intriguing regions for the cytologist.⁶ Not only is the duodenum a most remote area to reach but the exfoliation of cells is scanty and the cytological interpretation is more difficult. A rapid method of intubation has been described by us elsewhere.⁷ The availability of safe purified and standardized secretin undoubtedly has increased the accuracy of the examination. Tumors limited to the body of the pancreas can be detected by increased pancreatic secretion through stimulation with secretin; it is unlikely that these malignant cells would be recovered by nonhormonal drainage.

In 356 duodenal drainages performed since April, 1955, 55 proved carcinomas have been encountered: pancreas, 43; bile duct, 7; gallbladder, 1; carcinoma of the duodenum primary, 2; and metastatic, 2. Malignant cells were recovered in 33 (60%) of the 55 patients.

TABLE 2.—Duodenal Cytology

	No. of Patients	Cells Found
Pancreas	43	25
Bile ducts	7	3
Gallbladder	1	1
Primary duodenal	2	2
Metastatic duodenal	2	2
Total	55	33

The series includes three carcinomas of the head of the pancreas, and one of the left hepatic bile duct, in which at the time of operation the surgeon was

unable by palpation and biopsy to locate the neoplasms. Surgical diagnoses were made of chronic pancreatitis in three instances and cirrhosis of the liver in the fourth. All four individuals died within six months or less, and all had carcinomas proved by either autopsy or liver biopsy.

Of the 301 patients without cancer, the results of the cytological examination were negative in 299, and 2 false-positive examinations were made in patients with cholesterosis of the gallbladder (1) and a healing duodenal ulcer (1) which exfoliated cells morphologically compatible with malignancy.

Colon.—Colonic cytology has been utilized for the detection of tumors above proctoscopic range.⁸ Of the 183 examinations performed, 145 were negative clinically and cytologically. Of 38 clinically proved colonic malignancies, the cytological examination was positive in 36.

Of the two false-negative examinations, one was of a carcinoma in situ in a polyp of the descending colon; the other patient with a lesion in the middle of the descending colon had received castor oil unknown to us two hours before the examination, producing excessive fecal contamination of the wash. This test should have been declared unsatisfactory and repeated. An additional 11 patients have not been included in the series because the preparation of the intestine was technically so unsatisfactory that no report could be rendered.

In 10 of the 36 patients with positive cytological findings, the initial barium enema failed to make a diagnosis of carcinoma; in 5 of the 10 the result of the first roentgenologic examination was reported as normal. Only with knowledge of the positive cytological findings was the radiologist successful in the subsequent demonstration of these small tumors. The other five patients with roentgenologically unrecognized colonic cancer had diverticulitis, benign polyps, or ulcerative colitis.

TABLE 3.—X-ray versus Cytological Diagnosis in Thirty-eight Proved Cases of Cancer of the Colon

	X-ray		Cytological	
	No.	%	No.	%
Cancer	28	74	36	95
Inconclusive	5	13	0	0
No cancer	5	13	2	5

The epithelium of the colon is not as complex morphologically as that of the stomach. Therefore, with the exception of ulcerative colitis,⁹ great variations and gradients of cell structure are not encountered. Malignant cells are more readily recognized in this area than anywhere else. We have had no false-positive examinations to date.

Comment

In the past three years, in the examination of 1,561 patients, including 293 with gastrointestinal cancer, by the technique of exfoliative cytology, the

diagnostic accuracy of the procedure for the various portions of the digestive tract has been as shown in table 4. We conclude that exfoliative cytology is

TABLE 4.—Accuracy of Results of Cytological Examination of 1,561 Patients

Area	No. of Cancers	Cells Found	Accuracy, %
Esophagus	69	66	95
Stomach	131	125	95
Duodenum	55	33	60
Colon	38	36	95

applicable to all areas of the gastrointestinal tract as an accurate and definitive diagnostic procedure for the detection of cancer.

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This study was supported by a field investigation grant from the National Cancer Institute, National Institutes of Health, Public Health Service, the Stewart Fund to the University of Chicago, and the Wallach Fund for Research in Gastrointestinal Diseases.

The secretin used in this study was supplied by Dr. James B. Hammond, Eli Lilly & Company, Indianapolis.

Cytotechnicians Miss Sylvia Pleticka, Mr. Willard A. Yarema, and Mrs. Penny Ford assisted in the cytological procedures.

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TREATMENT FOR COMMINUTED FRACTURES OF THE OS CALCIS

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An analysis of the results of the treatment of comminuted depressed fractures of the os calcis leaves much to be desired. On the whole, the end-results are unsatisfactory. Much too often the patient ends up with a painful foot, limited in motion,

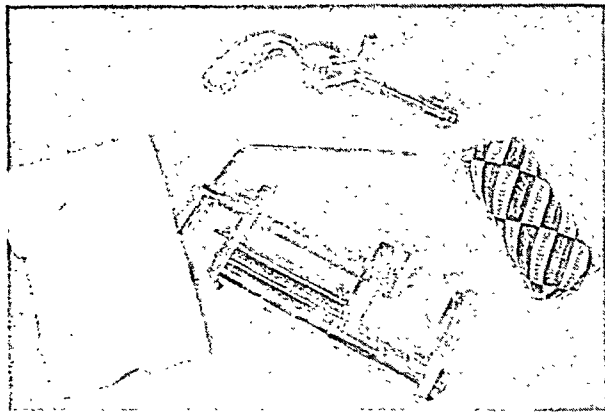


Fig. 1.—Drill bit, $\frac{1}{4}$ -in. Steinmann nail, Böhler os calcis clamp, 6-in. sheet wadding, and fast-setting plaster for use in treatment of comminuted fractures.

in spite of prolonged treatment and loss of time. In many instances the patient is unable to return to his former occupation and settles for a less vigorous job, usually at less pay. This poses an important economic problem. The resultant permanent disability is due to an incomplete reduction of the fracture and is manifested by a bony block under the lateral malleolus due to a spreading of the os calcis, a pronated foot, and an irregular subtalar joint.

The problems in accurately reducing a comminuted fracture of the os calcis are (1) elevation and restoration of the depressed central articular fragment to its original position, (2) restoration of the astragalocalcaneal angle (Böhler's angle), and (3) reduction of the transverse spread of the os calcis. To solve this problem, I have developed a procedure which modifies the methods of Dr. Böhler and Sir Watson Jones' by a few original maneuvers. Figure 1 illustrates the material and equipment used, namely, a drill bit, a $\frac{1}{4}$ -in. Steinmann nail, a Böhler os calcis clamp, 6-in. sheet wadding, and fast-setting plaster.

With the patient under general anesthesia and in a supine position, the involved foot, ankle, and lower third of the leg are surgically prepared and draped. The surgeon and assistants are surgically

Comminuted fracture of the os calcis frequently leads to prolonged disability. To prevent this, the reduction of the fracture must be accurate. The technique here illustrated involves the temporary insertion of a Steinmann nail into the part of the os calcis attached to the achilles tendon. This permits the application of tractions and thrusts in a way that elevates the depressed central articular fragment into its original position, restores the normal relation of os calcis to talus, and reduces the transverse spread of the fragments of the os calcis. After the cast has been applied, with the patient still under anesthesia, the nail is removed, and a program of postreductive treatment is carefully followed. Twenty-two patients so treated regained full motion of foot and ankle and have excellent function without dependence on any orthopedic appliances or other aids.

dressed. An associate elevates the draped leg. The insertion of the achilles tendon at the os calcis is palpated, and a $\frac{1}{4}$ -in. Steinmann nail is drilled into the os calcis at a 35-degree angle plantarward in



Fig. 2.—Lateral x-ray of foot, showing Böhler angle and angle and depth of insertion of Steinmann nail.

its axial plane. The depth of nail penetration is governed by the length of the posterior os calcis fragment as revealed by x-ray. Usually this is a

distance of 1 to 1.5 in. Figure 2 shows lateral x-ray of the foot, illustrating the Böhler angle and the angle and depth of insertion of the Steinmann nail.

The drill bit is now removed and a sterile 4-by-4-in. gauze dressing is passed over the nail to firm contact with the skin of the heel. The surgeon now faces the plantar surface of the foot. The fingers of the right hand grasp the protruding Steinmann nail as the right thumb is placed on the plantar surface of the heel at the mid-portion of the os calcis. The fingers of the left hand grasp the dorsum of the foot at the tarsometatarsal junction as the left thumb is placed on the plantar surface of the foot in the midtarsal area. Figure 3 illustrates the position of the fingers of the right hand as it grasps the Steinmann nail and the position of the right thumb as it pushes upward on the plantar surface of the os calcis.

Plantarward lever-like traction is then applied to the nail and forefoot against the upward thrust of the right thumb as it is used as a fulcrum against



Fig. 3.—Position of fingers of right hand grasping Steinmann nail and of right thumb pushing upward on plantar surface of os calcis.

the body of the os calcis. The traction and thrust are maintained while an associate places the Böhler os calcis clamp against the medial and lateral surfaces of the os calcis and quickly compresses the sideward spread of the fragments until normal configuration can be palpated and free space is present under the external malleolus. The os calcis clamp must be released quickly in order to avoid devitalization of the already embarrassed skin. Traction and thrust on the forefoot, nail, and os calcis are maintained, while the associate encircles the limb from the toes to the knee with sheet wadding and then plaster. The traction is released at separate individual points only momentarily to allow for the passage of the sheet wadding and plaster. As the plaster is applied it is molded well about the os calcis and nail. All traction forces are

maintained until the plaster hardens. Figure 4 illustrates the maintenance of all traction force while the plaster hardens.

When the cast is hard and with the patient still under anesthesia the Steinmann nail is removed with pliers by a gentle rotation of the nail in its long



Fig. 4.—All traction force maintained while plaster hardens.

axis. Care must be taken to avoid rough handling of the nail in order to prevent manual displacement of the posterior fragment. Postreductive care is similar to that of any fresh fracture on which a circular cast has been applied. 1. Elevate foot and

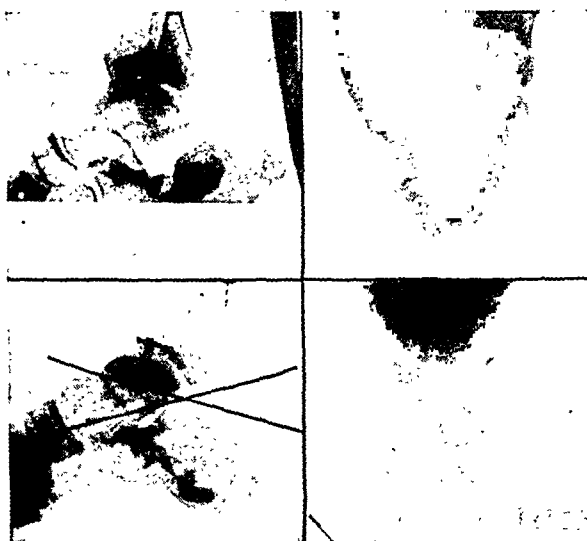


Fig. 5 (case 1).—X-rays showing fracture of os calcis at time of manipulation and three months later.

leg on pillows above the cardiac level for the first 24 hours. 2. Give medicaments for pain. 3. Observe the toes carefully for swelling and discoloration. 4. Bivalve the cast if necessary and then tape halves. If Webrill is used this may have to be split at the

time the cast is bivalved. 5. Promote early active toe motion, ambulation with crutches and non-weight-bearing. 6. Recheck x-rays at four-week intervals after postreductive films have been made. 7. Remove cast at 10 to 12 weeks post reduction, depending on the amount of callus formation. 8.

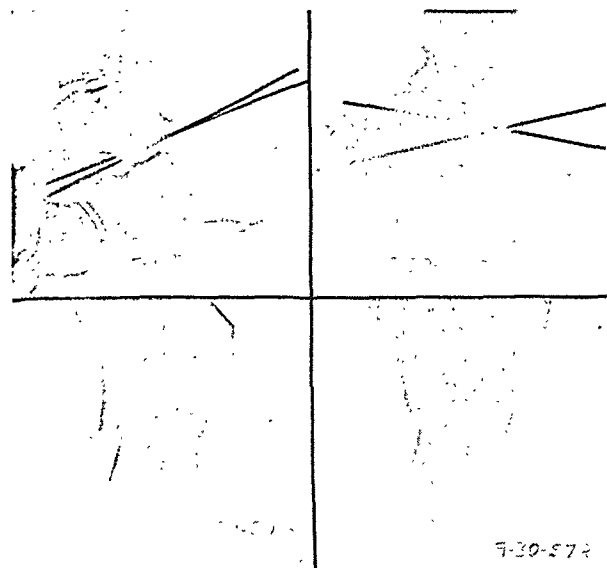


Fig. 6 (case 2).—X-rays showing fracture of os calcis at time of manipulation and five months later.

Apply regular shoe early. 9. Give physical therapy three times weekly for a period of six to eight weeks. 10. Permit graduated weight bearing at 14 to 16 weeks. 11. Permit full weight bearing and resumption of regular work at 18 to 20 weeks.

The results in the following cases are representative of those obtained in 22 cases in which this method was used.

Report of Cases

CASE 1.—A 44-year-old man (fig. 5) fell through a skylight, a distance of 25 ft., on June 23, 1955. The os calcis was manipulated on July 8, 1955. X-rays were taken again on Sept. 28.

CASE 2.—A 54-year-old man (fig. 6), weight 265 lb. (120.2 kg.), fell from a ladder, a distance of 8 ft., on May 1, 1957. Manipulation was done on May 7. The last x-ray, on Sept. 30, 1957, shows normal astragalocalcaneal angle and articular surface.

Comment

All of the foregoing patients were treated at the Little Company of Mary Hospital, and my associate was Dr. Fred Zeiss. Further, all of the patients have resumed their former occupations with a minimum of discomfort and are pleased with the result obtained. All patients have full motion of foot and ankle and are able to rise on their toes and walk on the lateral surfaces of their feet. None of them are wearing any orthopedic appliances or shoe lifts. Further, this method as described is simple, direct, and rapidly done, with control of all fragments at all times.

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RESPIRATORY INFECTIONS IN THE ELDERLY.—Infections of the respiratory tract are the most common cause of illness in all age-groups. Among elderly patients, however, they are potentially lethal. In fact, chronic bronchitis kills more people than either pulmonary tuberculosis or cancer of the lung. So often, a respiratory infection is the final complication which tips the precarious balance in old age. Many a patient with hypertension, cardiac failure or cerebral thrombosis has been stabilized until bronchitis supervenes. The necropsy findings of basal pulmonary edema with patchy consolidation are common terminal phenomena in so many chronic diseases of later life. Hence the prevention and treatment of the respiratory infections of the elderly are matters deserving careful attention from both general practitioners and specialists . . . After an acute respiratory illness, an elderly patient should be given adequate convalescence. While the bedfast state is bad for the aged, their myocardium takes time to return to normal after a chest infection. Slow, gradual rehabilitation is the rule, using a large comfortable arm-chair as a domestic gymnasium. The exercise of getting from bed to chair and back again can be of great benefit to the patient. Walking round the chair, with its back as support, is the first excursion to be permitted. Using the end of the bed to pull the body into an upright position is another valuable form of domestic gymnastics. Incidentally, a room temperature of 70 F (21 C) or more is desirable for both nursing and rehabilitation of old folk. Exposure to cold will undo much good work.—T. H. Howell, F.R.C.P. Ed., *The Prevention and Care of Respiratory Infections in the Elderly*, *The Practitioner*, December, 1958.

BASIC CONCEPTS ABOUT SHOULDER-ARM SYNDROME

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Shoulder-arm syndrome, sometimes called reflex sympathetic dystrophy, is a disorder characterized by dysfunction of the sympathetic nerves to an upper extremity. This syndrome has been recognized for a long time, and the literature on the subject is more voluminous than the accepted knowledge about it. Much remains to be explained about the details of the mechanisms involved in the syndrome, but in the searching for details sometimes the basic concepts about the disease have been overlooked. The purpose of this paper is to review some of these fundamental and practical concepts.

First, the shoulder-arm syndrome is a psychosomatic disease with an anatomic or physiological component and a psychological or psychiatric component. If treatment of the disease is to be successful both components must be treated.

Accuracy of Diagnosis

Second, before scientific treatment can be started, an accurate diagnosis must be made. Too frequently shoulder-arm syndrome is a "waste basket" diagnosis. When the patient fails to respond to the prescribed type of treatment his physician may be inclined to wonder if there is not perhaps a little element of sympathetic dystrophy associated with the original diagnosis. Before other diseases are ruled out, a course of nerve blocks or a series of physical therapy treatments may be arranged, all of which may be useless or even harmful if the patient has coronary heart disease or some other cause for the disability.

An accurate diagnosis of shoulder-arm syndrome is not made more often for two reasons; the diagnosis is difficult to make, and the efforts of the group of physicians usually involved in the treatment of the patient with this syndrome are not closely coordinated. The diagnosis is difficult to make because the signs and symptoms are not always characteristic, because there are few objective tests by which the diagnosis can be proved, and because the syndrome is almost always associated with other diseases and disabilities. Usually the diagnosis is made by elimination or exclusion of other factors that might be causing the patient's symptoms.

These difficulties in diagnosis are compounded by the fact that a single physician rarely follows a patient with shoulder-arm syndrome from start

The shoulder-arm syndrome is a painful disability that sometimes follows a sprain, laceration, or simple fracture. Although the immediate cause may have been trivial, the patient continues to have a swollen, discolored, tender, painful, and functionless arm and hand. An accurate diagnosis must be made before treatment is begun, and the possibility that the patient has an incompletely reduced dislocation, ununited fracture, or neuroma must be excluded. If the diagnosis is correct, it will be confirmed by the relief afforded by injecting a short-acting anesthetic agent about the stellate ganglion on the same side as the disability. Such relief corroborates the diagnosis, makes it possible to start physical therapy on a previously painful limb, and indicates a good prognosis. The psychological complications of this syndrome are such that sometimes the special abilities of a psychiatrist are absolutely necessary for special and difficult patients. The structural and functional components of the condition must both be treated, and the best results are obtained by the physician who is most genuinely interested in the patient.

to finish. Frequently the treatment is prolonged and either the patient becomes discouraged and seeks new advice or the physician becomes doubtful and seeks consultation. The specialties most likely to be involved are surgery, internal medicine, anesthesiology, physical medicine, and psychiatry. For example, a patient gets a painful disability of an upper extremity, the cause of which may be serious but is more likely to be trivial, such as a sprain, laceration, or simple fracture. Appropriate treatment is given, and in due time the original disability is eliminated but the patient continues to have a swollen, discolored, tender, painful, functionless arm and hand. Then, either the surgeon or the anesthesiologist blocks somatic nerves in trigger areas, if such are present, or else blocks the sympathetic nerves. The physiatrist may be asked to rehabilitate the arm and hand, and the psychiatrist may be needed to rehabilitate the patient.

The accurate definite diagnosis of shoulder-arm syndrome is the primary responsibility of the surgeon and internist. They must rule out all possible

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pathology that might be causing the sympathetic dystrophy. It is not good practice to start a series of nerve blocks or physical therapy treatments only to discover later that the patient has an incompletely reduced dislocation, an ununited fracture, or a neuroma.

The services of the anesthesiologist, physiatrist, or psychiatrist are ancillary or auxiliary because theirs is a consultation practice. However, this does not relieve them from responsibility of confirming the diagnosis made or suspicion by the surgeon or internist. Each consultant must question and be convinced of the accuracy of the diagnosis. As will be shown, the attitude of each physician is an important factor in the success of the treatment of shoulder-arm syndrome. The thoughts and actions of all the physicians on the team must be well coordinated by frequent thorough communications in order to avoid confusing the patient. Since confusion is one of the elements of the patient's disease, disorganization among his physicians could possibly "add fuel to the fire." When a patient is transferred from one physician to another it is necessary that all available information on the following subjects accompany the patient: complete diagnostic data, other diagnoses, past and current treatment, results of such treatment, and the explanations that have been made to the patient.

The most useful test in establishing the diagnosis of shoulder-arm syndrome is the injection of a solution of a short-acting anesthetic agent about the stellate ganglion on the same side as the disability. If the symptoms of the syndrome are relieved for the expected duration of the block, the evidence is good that sympathetic dysfunction contributes to the disability. If the symptoms are relieved for a longer time than the expected duration of the block, the prognosis is good that the physiological component of the syndrome will respond to a series of similar repeated sympathetic nerve blocks.

Treatment of Physiological Component

The third basic concept is that after the diagnosis of uncomplicated sympathetic dystrophy has been definitely and accurately made, the indicated treatment of the anatomic and physiological component is interruption of sympathetic nerve impulses to the arm involved. Just how this functional interruption of sympathetic nerves is effective is not completely understood, but, if the diagnosis is correct, there is little doubt but what it is helpful. It has been postulated that the original disability invokes an alarm reaction, one part of which is increased sympathetic outflow. In time this continued sympathetic outflow causes pathological changes in the arm and hand which act as a feedback mechanism for continued increased sym-

thetic outflow. If the sympathetic outflow can be blocked long enough and completely enough to allow the pathological changes in the extremity to heal, the cycle is broken and the patient recovers.

Several methods are available for breaking this vicious cycle. Sympathetic outflow may be interrupted by frequent injections of short-acting anesthetic agents, by less frequent injections of longer-acting anesthetic agents, or by surgical resection of the upper thoracic sympathetic trunk on the side of the disabled extremity. The technique used can be selected to suit the convenience of the patient, since each is effective provided the nerve block is sufficiently complete in degree and duration. Injections should be made in the same fascial plane as the sympathetic trunk at the level of the first thoracic vertebra or below. Injections made more cephalad may produce a Horner's syndrome without a sufficiently complete block of the sympathetic fibers to the arm to control the disease. The earlier in the course of the syndrome that sympathetic nerve interruption is accomplished, the shorter will be the necessary duration of treatment and the more successful will be the treatment. The pathological changes caused by long-standing sympathetic overactivity are corrected slowly and with difficulty.

Physical therapy can hasten resolution of the pathological changes in the extremity and is a valuable adjunct to sympathetic nerve blocks. Frequently the involved arm may be so painful and tender that adequate physical therapy cannot be accomplished. For these patients appointments should be coordinated so that physical therapy can be instituted immediately after the tenderness has been abolished or reduced by a sympathetic nerve block.

Treatment of Psychological Components

The fourth concept is that treatment of the psychological component of the disease alone is not sufficient. Even if arrangements could be made for two physicians of equal technical ability to use the same therapeutic procedure and produce identical physiological results, it would be possible for one to cure a majority of his patients while the other would cure only a few of his. The difference in results would lie in the fact that the successful physician treated the psychological component of the disease along with the physiological component, while the less successful physician disregarded the psychological component.

Directions for successful treatment of the psychological component are less definite and less easily outlined than are those for treating the physiological component. In general, the method of winning the patient's confidence must be varied to fit the personality of the patient. Some physicians seem to acquire this skill easily, but all can im-

prove their ability with thought and experience. Only three essential factors for successful treatment of the psychological component of shoulder-arm syndrome will be discussed—interest, sympathy, and encouragement.

Regardless of specialty, the successful physician must exhibit a personal interest in his patient. It is not sufficient for him to be interested only in the affected extremity and related pathology. He must be interested in the patient as a person. This type of interest can be manifested by conversations with the patient about the patient's general health, family, social life, hobbies, and even financial and economic problems. Once the proper physician-patient relationship has been established, it has been observed on occasion that the patient has developed a will to get well, not for the benefit that the patient himself would derive but because otherwise the good doctor friend would be depressed if his treatment was not successful. Such an extreme effect is rare but serves as an example of the powerful effect of an interest by the physician in the patient as a person and friend.

The necessity for sympathy on the physician's part carries the relationship a little farther. The physician must not only be interested in the patient but be sorry for the patient and be determined that the patient will be restored to good health. Sympathy must be genuine. The substitution of a feigned bedside-manner type of sympathy is quickly recognized by these patients who usually have had extensive experience with doctors, not all of it pleasant. Having been regarded as neurotics, drug addicts, and malingerers and passed from consultant to consultant like unsavory characters, they tend to become paranoid, suspicious, and critical. Unless the physician is fully convinced about the accuracy of the diagnosis, he will not be able to feel the necessary degree of sympathy for these patients.

When treatment becomes prolonged and progress is slow, the patient may become discouraged and need encouragement. He may develop personality defects which may have to be changed. Sometimes a will on the part of the patient to get well has to be developed. The disability may have come to be regarded as a haven from which the patient unconsciously fears to depart. The pain may be his means of getting the narcotics which he feels he cannot do without. If compensation for injury is being received, the patient may fear to lose this economic support. He must be convinced that he again is able to successfully compete in the struggles of everyday life. If encouragement to make this step toward accepting the responsibilities of a normal individual has to come from someone other than the patient, what source of encouragement is more logical than the patient's own physician?

Another psychological problem that may have to be overcome is the antagonism that the patient develops against his own painful arm. The biblical writer who advised "if thine right arm offend thee, cast it off" must have understood patients with shoulder-arm syndrome, because subconsciously some patients actually do just that. The offending arm comes to be regarded as something apart from the remainder of the body and may be regarded as an enemy of the body. Under these circumstances the physician's duty is to reestablish a friendly relationship between the patient and the patient's own arm. Even complete and continuous sympathetic nerve block will not effect rehabilitation if the patient persists in keeping the arm rigid, stiff, and functionless. However, if the tenderness and pain can be eliminated by nerve blocks, the physiatrist can encourage and persuade the patient to start using the arm to perform activities beneficial to the body. In this way the antagonism can be eliminated slowly, and encouragement becomes effective for subconscious readmission of the arm into the coordinated family of the organs of the body.

The psychiatrist is better trained to handle all these problems in the treatment of the psychological component of shoulder-arm syndrome than are the other members of the team of physicians. Sometimes his special abilities are absolutely necessary for the special and difficult patients. On the other hand, the surgeon and the internist and even the anesthesiologist and physiatrist have a golden opportunity of treating both somatic and psychic components of the disease simultaneously. By treatment of the physiological component and at the same time offering to the patient interest, sympathy, and encouragement, a favorable rapport can be established which may more than offset the scientific advantages of the psychiatrist. The physician who has earned the greatest degree of the patient's confidence is the one who is going to be most successful in treating shoulder-arm syndrome.

Summary

For the successful treatment of shoulder-arm syndrome, four basic concepts should be recognized. 1. Both physiological and psychological components of the disease must be treated. 2. An accurate diagnosis must be made before treatment is started. 3. The physiological component should be treated by functional interruption of the sympathetic nerves to the extremity with a method that is sufficiently complete and sufficiently continuous. 4. The physician should exhibit genuine interest, sympathy, and encouragement toward the patient as a person.

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PAIN IN THE SHOULDER AND ARM FROM NEUROLOGICAL INVOLVEMENT

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Pain in the upper extremity may arise from a variety of causes, but commonly it is the result of involvement of the nervous system. Such involvement may occur in the spine, in the brachial plexus, or in the peripheral nerves in the extremity.

Herniated Cervical Invertebral Disk

The most common neurological cause of pain in this region undoubtedly is a herniated cervical intervertebral disk. Although such lesions are not as common here as they are in the lumbar portion of the spine, they are very common. With few exceptions the herniations are found at the interspace between the fifth and sixth or the sixth and seventh cervical vertebrae. The symptoms produced by such lesions are remarkably stereotyped and characteristic. Typically the onset is with pain and stiffness of the neck. For a time these may be the only symptoms, and they may disappear and recur with variable frequency and over different periods of time. Sooner or later the patient begins to suffer from a radiation of the pain along the medial border of the scapula, into the shoulder, and at times into the anterior chest wall. This latter may be so severe as to cause the attending physician to think seriously of disease of the coronary arteries. The pain also radiates down the lateral aspect of the arm and at times into the fingers. On other occasions there is no true pain in the fingers but an annoying numbness and paresthesias.

When the herniation lies between the fifth and sixth cervical vertebrae, the sixth cervical spinal nerve root is compressed. As a result, the pain or numbness or both involve the thumb primarily and the index finger to a lesser degree. In addition, the biceps muscle is weak and the biceps reflex reduced or abolished. When the herniation lies between the sixth and seventh vertebrae the seventh spinal root is involved. The numbness and/or pain is in the index and middle fingers, the triceps muscle is extremely weak and often flabby and atrophic, and the triceps reflex is abolished.

Herniation at either of these interspaces is at times associated with numbness of the ulnar border of the hand and of the last two digits. This mis-

Pain in the shoulder and arm can often be traced to disease involving the vertebral column, the brachial plexus, or the peripheral nerves of the upper extremity. Case histories are given to illustrate the appearance of such pain as an early symptom in herniation of the intervertebral disk between the seventh cervical and first thoracic vertebrae, in intraspinal neurofibroma at the level of the third and fourth cervical vertebrae, in carcinoma of the pulmonary apex, in aneurysm of the subclavian artery, and in neurogenic sarcoma involving the radial nerve just above the elbow. Exquisite localization and sensitivity characterize small glomangiomas occurring in the subcutaneous tissues and small neurogenic sarcomas on subcutaneous nerves. Treatment of any of these conditions is most difficult unless the diagnosis is accurate. When a suitable lesion is found, operation often affords prompt and permanent relief of symptoms.

leading symptom apparently arises from a spasm of the scalenus anticus muscle and is of no localizing value so far as the intraspinal pathology is concerned. In rare instances, however, paresthesia in the ulnar distribution is indicative of a herniation between the seventh cervical and first thoracic vertebrae, with compression of the eighth cervical nerve root. In such cases the correct diagnosis is indicated by the fact that the pain in the arm radiates down the medial rather than the lateral aspect. This situation is described in case 1.

CASE 1.—A 43-year-old man was referred to us by Dr. N. C. Johns of South Bend, Ind. He was admitted to the Chicago Wesley Memorial Hospital on March 2, 1958, because of pain of approximately one year's duration in his right arm.

In the spring of 1956 and 1957 he had noted some temporary discomfort in his neck after spring gardening. There was no history of any injury to his neck. In the spring of 1957 the discomfort in his neck had been followed by a severe pain along the medial aspect of his right upper and lower forearm. At the same time numbness and tingling had appeared in the right little finger and the medial aspect of the fourth finger. Over a period of several weeks this improved, and he became able to return to work, but some numbness and pain continued. In February, 1958, his condi-

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tion became worse. He developed a cramping pain in the last two digits of his right hand, and flexion of his neck aggravated the pain in his arm and hand.

Examination revealed only an atrophy of the right hypohyoid muscle mass. X-ray films of the cervical spine showed only a questionable narrowing of the interspace between the seventh cervical and first thoracic vertebrae (fig. 1, *left*). A myelogram was made which disclosed a large defect at the interspace between the seventh cervical and first thoracic vertebrae (fig. 1, *right*). X-ray examination of the chest, the remainder of his physical examination, and the examinations of his blood, urine, and spinal fluid were all negative. The total protein in the spinal fluid was normal, 34 mg. per 100 cc. of fluid.

On March 4, 1958, a large herniation of the intervertebral disk between C-7 and T-1 was removed. The patient made a prompt recovery, was discharged from the hospital on March 14, 1958, and was soon back at work.

Comment.—The diagnosis of a herniated cervical intervertebral disk is made primarily on the basis of the history and the physical findings. As in the case cited above, the x-ray examination of the cervical spine is often not helpful, or it may reveal only a straightening of the spine or a reversal of the normal lordotic curve (fig. 2, *left*). In many cases, however, one may find a localized narrowing of the intervertebral spaces, usually between C-5 and C-6, and/or C-6 and C-7 (fig. 2, *right*). Such narrowing is commonly associated with osteoarthritic spur for-

intervertebral disk. Nevertheless, such changes may be misleading so far as involvement of the nervous system by herniated intervertebral disks is concerned. Such changes may be present without any evidence of involvement of either the spinal nerves or the spinal cord. Furthermore, such changes are



Fig. 2.—*Left*, herniation of intervertebral disk between fifth and sixth cervical vertebrae. Normal curvature of cervical spine is lost and replaced by reversed curve with apex at fifth cervical vertebrae (fig. 1). *Right*, herniated intervertebral disk between sixth and seventh cervical vertebrae. There is marked narrowing of intervertebral spaces between fifth and sixth and sixth and seventh cervical vertebrae, with narrowing of sixth cervical vertebral body and osteoarthritic spur formation.

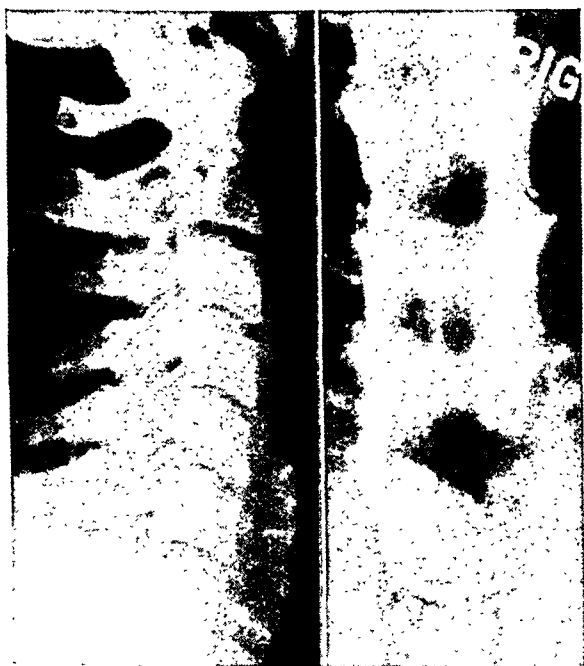


Fig. 1. (case 1).—*Left*, herniated intervertebral disk between seventh cervical and first thoracic vertebrae. X-ray examination of spine is essentially normal. *Right*, myelogram showing large defect in the column of iophendylate at C-7-T-1 interspace on right side.

mation on the neighboring vertebral bodies. Obviously such narrowing of the intervertebral space is indicative of degenerative changes within the

commonly present at one level while the compression of the spinal nerve is at the neighboring interspace. Or, as has been pointed out above, a herniation of the disk may be present with a perfectly normal x-ray picture of the cervical spine.

Examination of the spinal fluid seldom provides much information in cases of herniated cervical intervertebral disks. The protein content of the fluid may or may not be slightly elevated, but striking increases in the amount of protein or evidence of obstruction of the spinal subarachnoid space, as shown by Queckenstedt's test, are seldom encountered.

Myelography, or visualization of the spinal canal with the aid of the x-rays and a contrast medium (usually iophendylate [Pantopaque]) will provide positive evidence of a herniated intervertebral disk in the cervical region in almost every instance (fig. 1, *right*). However, in the vast majority of cases the diagnosis can be made without such an examina-

tion, and we proceed to treat the patient in most cases without resorting to this test. In case 1 cited above, a myelogram was made because herniations at the C-7-T-1 interspace are so uncommon that we felt that our diagnosis should be confirmed before we subjected the patient to an operation. As it turned out it was quite unnecessary even here.

Treatment.—There is considerable difference of opinion regarding the treatment of choice in cases of herniated cervical intervertebral disk. Some neurological surgeons, notably Scoville, and Semmes and Murphey, feel that most, if not all, patients suffering from a herniated disk in this region should be operated on. We cannot share that opinion. In our experience about 80 to 85% of these patients are relieved by relatively simple conservative treatment. Such treatment consists of continuous cervical traction with 5 to 10 lb. for a period of approximately 10 to 14 days or until the acute symptoms have subsided and then relative immobilization of the neck in a plastic collar whenever the patient is up and about and possibly traction on the neck at night for another few weeks. In our experience intermittent traction with much greater amounts of weight one to several times a day for short periods is not very beneficial, and we have seen a few patients whose condition appeared to have been aggravated by such treatment. If bed rest with cervical traction does not provide fairly prompt lessening of symptoms, if there is profound muscular weakness and atrophy, or if the condition has been present for more than a very few weeks, or has been recurrent, we recommend that the patient be operated on and the offending herniated cartilage removed. We do not believe that any effort should be made to remove the disk material from between the vertebral bodies, nor do we believe that any form of spinal fusion is indicated in these cases. It seems to us that the anterior approach to the vertebral bodies with removal of the intervertebral disk from in front is a more drastic and more potentially dangerous operation than is required for a simple herniated cervical intervertebral disk.

Spinal Cord Tumor

Tumors arising in the cervical portion of the spinal canal can certainly produce pain in the neck, the shoulder, and the upper extremity, and frequently they do so. However, such lesions are far more rare than are herniated intervertebral disks in this region and usually produce other symptoms which soon make it obvious that we are dealing with something more than a simple lesion giving rise to a brachialgia.

At the onset, tumors, like herniated disks, may involve a single spinal root and may at that stage give rise to pain limited to the shoulder and arm on one side. Soon, however, the pain becomes more extensive than can be explained by the involvement

of one nerve root; it spreads to the opposite side of the body; marked muscular weakness and atrophy appear in one or both upper extremities; and evidence of involvement of the spinal cord, with sensory changes on the trunk and in the legs and with weakness of the legs and difficulty in walking, and disturbances of the functions of the intestines and bladder appear. Examination, too, reveals changes beyond the confines of one shoulder and arm, with sensory alterations and disturbances of the reflexes in the legs as well as the arms. Examination of the cerebrospinal fluid will usually reveal evidence of obstruction of the spinal canal, an increase in the protein content, and often a xanthochromia of the fluid. Case 2 is a typical example.

CASE 2.—A 55-year-old housewife was referred to us by Dr. Meyer Solomon of Chicago and was admitted to the Chicago Memorial Hospital on March 14, 1949. She had enjoyed good health until early in the year 1948, a little more



Fig. 3.—X-rays (similar to those in case 2) showing, *left*, lateral view of cervical spine revealing no abnormality and, *right*, oblique view of same spine disclosing marked enlargement of intervertebral foramen between C-3 and C-4 and erosion of neighboring pedicles. Importance of oblique views of cervical spine for recognition of such changes is clearly demonstrated.

than a year prior to her admission. At that time she began to suffer from sharp pains in the back of the neck on the left side. These radiated into the left shoulder and down the left arm. They were aggravated by lying down, especially by lying on her left side, and by even slight movement of her neck. These pains grew more severe. By early summer of that year tingling developed in the fingers of the left hand and soon extended up the left arm. Shortly thereafter the left arm became weak, and this weakness steadily progressed over the next several months to an almost complete paralysis of the left upper extremity. In the autumn of 1948 she first noted numbness of the left foot. Soon the left lower extremity became weak, occasionally causing her to fall. In January, 1949, she became unable to walk and developed difficulty in urination and in bowel movements. At about this same time

paresthesia and weakness appeared in the right upper extremity, and she became unable to feed herself. She also complained of a hand-like sense of constriction about the upper part of her chest.

On examination we found no evidence of involvement of her cranial nerves. There was an almost complete paralysis of her left upper and lower extremities and a diffuse atrophy of the left arm and hand. There was also a severe weakness of the right extremities. She was unable to stand. All tendon reflexes were grossly exaggerated, especially on the left side. The abdominal reflexes were absent and Babinski's sign was present bilaterally. Her neck was rigid and any movement of it would cause her to cry out with pain. There was a complete anesthesia along the medial aspect of the left arm and including the left hand and fingers. In addition there was a profound reduction in all forms of sensibility up to the clavicles bilaterally.

X-ray examination of the cervical spine revealed a marked enlargement of the intervertebral foramen between the third and fourth cervical vertebrae on the left side and an erosion of the pedicles of the third and fourth cervical vertebrae (fig. 3). The diagnosis of an intraspinal tumor, probably a dumb-bell neurofibroma at the level of the third and fourth cervical vertebrae was made; without further investigation the patient was operated on on March 17, 1949, and a large tumor of this type completely removed. Recovery began almost immediately and was rapid. Within two weeks she was able to empty her bladder voluntarily and to walk with the aid of the nurses. She was discharged to her home on April 6, 1949, and her recovery was soon complete.

Comment.—This is the typical story of an intraspinal tumor. The initial symptoms were those of irritation of the posterior spinal roots locally. Furthermore, the pain produced by this irritation was worse on lying down, as it so often is with intraspinal neoplasms. Soon, however, the manifestations of the presence and of growth of this tumor became more widespread, and evidence of involvement of the spinal cord as well as the nerve roots appeared. This more extensive involvement included the opposite upper extremity, the trunk, and both lower extremities. Nothing but a space occupying intraspinal lesion could have given rise to this picture. Fortunately, such conditions are usually easily recognized, and if proper treatment is prompt the results are commonly most gratifying.

Involvement of the Brachial Plexus

Trauma.—The brachial plexus may be involved in many ways. The more common are trauma, tumors of the lung, cervical ribs, spasm of the scalenus anterior muscle, and aneurysms of the subclavian artery. Trauma seldom causes any confusion. The responsible factor, be it a gunshot wound, an automobile accident, a knife wound, or some other type of trauma, is usually apparent. The paralysis and sensory loss resulting from damage to the plexus is commonly severe. The pain is of the diffuse, burning type commonly seen in causalgia. Usually it is aggravated by external stimuli and emotional disturbances. Its treatment is often difficult. If the local injection of procaine (Novocain) hydrochloride into the cervicothoracic portion of the ganglionated sympathetic chain provides definite relief, a sympathectomy may be considered.

Cervical Rib.—Fortunately cervical ribs seldom give rise to symptoms, but on occasion the lower part of the brachial plexus and the subclavian artery become compressed between the extra rib and the scalenus anterior muscle. In such cases the vascular symptoms and findings are obvious, and one should hesitate to make the diagnosis in their absence. The neurological symptoms are predominantly those one would expect from involvement of the eighth cervical and first thoracic nerve roots. These include pain and numbness of the ulnar border of the hand and last two digits and atrophy and weakness of the small muscles of the hand. The rib should, of course, be demonstrable on x-ray examination, and palpation in that area will commonly disclose the presence of a prominent subclavian artery and a fulness in the base of the neck even though the rib itself cannot be felt. In some instances section of the scalenus anterior muscles will suffice to give relief, whereas in others the offending rib may have to be removed.

Scalenus Anterior Syndrome.—Not many years ago the "scalenus anticus syndrome" was a common diagnosis and many patients were treated for this condition. It is now recognized that a scalenus anterior syndrome in the absence of a cervical rib is usually secondary to some other condition. In most instances this other condition is a herniated cervical intervertebral disk, as we have noted above. On one occasion I observed a woman with a typical scalenus anterior syndrome—involvement of the subclavian artery and lower part of the brachial plexus—where the difficulty had arisen as the result of a fall on her outstretched hand and the development of a tear in the scalenus anterior muscle and a hemorrhage. The condition soon subsided spontaneously.

Carcinoma of the Lung.—One of the more common and most tragic causes of pain in the shoulder and upper extremity is involvement of the brachial plexus by a carcinoma which has spread upward from the apex of the lung—the Pancoast tumor. In these cases the pain is generally severe. Although it is sharply localized to the shoulder and upper extremity on one side, it is usually diffuse in these areas and not localized to the distribution of any one peripheral nerve or spinal root. In addition to the involvement of the peripheral nerves of the upper extremity, it is common for the uppermost part of the thoracic ganglionated sympathetic chain to be involved, giving rise to a typical Horner's syndrome—slight ptosis of the upper eyelid, narrowing of the pupil, and loss of perspiration on that side of the face. Eventually there is marked muscular atrophy and weakness in the involved upper extremity as well as the generalized systemic manifestations of the pulmonary malignancy.

Unfortunately the tumor in the lung almost never gives any indication of its presence prior to the signs of neurological involvement. By this time all

hope of curing the tumor is lost. Relief of the pain from which these people suffer is difficult. High cervical cordotomy which theoretically should relieve them seldom does because of the difficulty in producing a permanent analgesia in the neck,

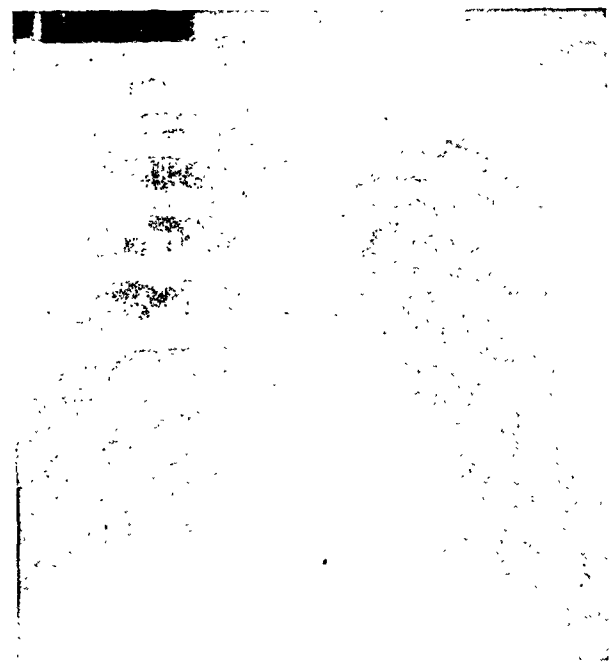


Fig. 4 (case 3).—X-ray of chest showing carcinoma at apex of left lung.

shoulder, and upper extremity. In most cases the best method of providing relief is a frontal lobotomy. Case 3 is typical of this group.

CASE 3.—A 44-year-old man was referred by Dr. S. W. Banks and was admitted to the Chicago Wesley Memorial Hospital on March 30, 1957. About the first of the year he had noted a severe pain in the left shoulder. This had soon extended into the medial aspect of the left upper arm and forearm and into the hands and fingers. Gradually the small muscles of the hand had wasted and the entire extremity became weak.

Examination revealed moderate winging of the left scapula and weakness of the left latissimus dorsi muscle. All of the muscles of the left upper extremity had approximately half their normal strength. There was a mild hypalgesia in the area of distribution of the ulnar nerve. There was a fulness in the left supraclavicular fossa and various extension maneuvers of the head and neck suppressed the left radial pulse. X-ray examinations of the chest and cervical spine were negative. A diagnosis of a scalenus anterior syndrome was made, and this muscle was divided by Dr. Walter Maddock, with dramatic relief. Four weeks later, however, the patient returned with a recurrence of his symptoms. Horner's syndrome was now present on the left side. The swelling in the supraclavicular region was more marked and was tender. The findings previously present were unchanged except that the radial pulse could no longer be modified by movements of the head and neck. X-ray examination of the chest at this time revealed a definite area of increased density in the left pulmonary apex (fig. 4). The diagnosis of a carcinoma of the lung was now obvious. It was treated with x-ray therapy and nitrogen mustard by Dr. T. H. Clarke with some temporary

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Aneurysm.—Involvement of the brachial plexus by an aneurysm of the subclavian artery is not common, but case 4 is typical of this condition.

CASE 4.—For seven months this 51-year-old man had suffered from a dull pain when using his right hand, cramping at the base of the thumb, and loss of strength in the hand. For three months the right hand had been cold and sometimes blue. Exercise for any length of time was impossible because of pain. For one month he had had pain on the medial aspect of his forearm and some discomfort in the right supraclavicular region. He was more comfortable when he slept with his arm above his head. At times the fourth and fifth fingers of his right hand felt numb.

Examination revealed a pulsating mass in the right supraclavicular region, which was somewhat tender (fig. 5). His blood pressure was 180/10 mm. Hg in the left arm but could not be obtained on the right. There was a hyperesthesia on the medial aspect of the right forearm and slight weakness of the musculature of the right hand. There was no atrophy and no sensory loss. The right hand was cooler and paler than the left. The pallor was increased by elevating the right extremity. The fingernails on the right side were slightly cyanotic. X-ray examination revealed bilateral cervical ribs.

A diagnosis of an aneurysm of the subclavian artery was made and the patient was operated on. There was an aneurysm lying distal to the tendon of the scalenus anterior muscle, and the artery was definitely constricted beneath the tendon of that muscle. The muscle was divided. The results were most gratifying. The hand resumed a normal appearance, and there was no pain even with use of the hand. The radial pulse improved, but the blood pressure could not be elicited on the right side. The patient died three years later of a coronary occlusion.

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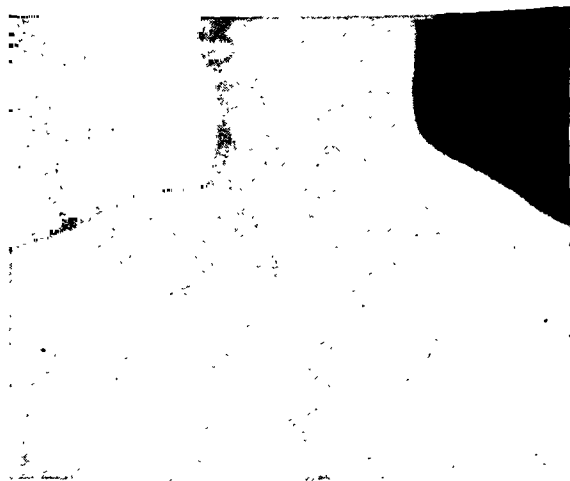


Fig. 5 (case 4).—Aneurysm of right subclavian artery causing supraclavicular swelling.

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Involvement of Peripheral Nerves

In civilian practice involvement of the peripheral nerves is an uncommon cause of pain in the upper extremity. During war, on the other hand, gunshot wounds of the nerves in the arm commonly give rise to severe pains, known as causalgia. Such pain may be relieved by sympathectomy but is difficult to treat satisfactorily in many instances. Case 5 is an unusual instance of severe pain in the arm arising from a tumor in a peripheral nerve.

CASE 5.—A 2-year-old boy was operated on by Dr. Sam W. Banks. He was admitted to the Chicago Memorial Hospital on June 4, 1953, because of severe pain and tenderness in his right arm. About four months earlier his grandmother had inadvertently twisted his right arm in pulling him away from an electrical outlet. Almost immediately thereafter he began to complain of pain above his right elbow and cried out violently each time the arm was touched. He did not use the arm as much as formerly.

On examination the right arm appeared to be moderately swollen just above the elbow, and the child made every effort to prevent anyone from touching this part of the arm or in any way examining it. Nevertheless he used the arm moderately well. X-ray examination of the right humerus and of the elbow joint was negative.

On June 4, the tender area was explored surgically. There was a diffuse swelling of the radial nerve over a distance of approximately 1.5 in. where it lies between the brachioradialis and the more medially placed muscles. This appeared to be a tumor, and that portion of the nerve containing the tumor was excised. The two ends of the nerve were approximated with appropriate sutures. The arm was immobilized in a cast with the elbow flexed. Microscopic examination of the tumor showed it to be a neurogenic sarcoma. The arm

was gradually extended and the cast removed. The boy made a complete recovery, and when last seen on May 14, 1958, he was perfectly well. There was no evidence of recurrence of the tumor and no muscular weakness or atrophy, no reflex changes, and no sensory loss.

Glomangioma.—Another type of lesion which occasionally gives rise to pain in an upper extremity is a glomangioma. These neurovascular tumors commonly develop beneath the fingernail but may occur elsewhere in the subcutaneous tissues. Small neurogenic sarcomas on subcutaneous nerves may give rise to similar symptoms. Both types are characterized by their exquisitely localized and intense sensitivity. They commonly give rise to pain when the hand is unintentionally bumped against some object such as a piece of furniture. Under the fingernail, and occasionally in the subcutaneous tissues, they may be seen as small bluish masses. Although the point of tenderness is sharply localized, the intense pain which is produced when these tumors are struck sharply radiates upward and often involves the entire upper extremity. Prompt relief is obtained by their removal.

Comment

The various types of lesions involving the nervous system which may give rise to pain in the shoulder and upper extremity are far more numerous than the few which we have enumerated here. However, these are the more common and are typical of the other less common lesions which may occur intraspinally, in the brachial plexus, or in the peripheral nerves in the upper extremity.

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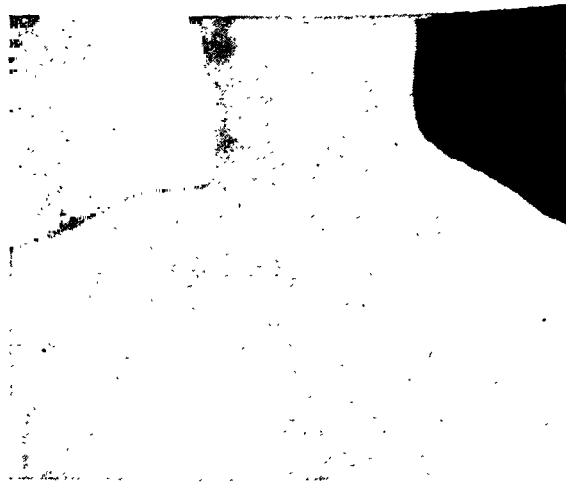


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PAIN IN THE SHOULDER AND UPPER EXTREMITY

VISCERAL CAUSES CONSIDERED BY THE INTERNIST

Edward H. Morgan, M.D., Seattle

In medical practice, patients who complain of pain in the shoulder and upper extremity are commonly encountered. Whereas there are many causes for pain so located, two principal categories exist—local and remote. As pointed out by Albert and Rechtman,¹ the differentiation of these two broad categories is usually simple, since the absence of objective findings at the site of pain leads one to consider remote causes. While the remote causes are many and varied, this paper will be concerned with pain in the shoulder and upper extremity caused by diseases of cardiovascular, respiratory, gastrointestinal, and genitourinary systems. To be excluded is the stiff painful shoulder produced by adhesive capsulitis associated with the inactivity of myocardial infarction, pulmonary tuberculosis, and other disabling disorders.

Anatomic Considerations

The patient who complains of pain in the shoulder often uses the term shoulder broadly. When patients so afflicted are asked to indicate the site of pain, they often designate areas far beyond the confines of the shoulder itself. Hence, for the sake of establishing the patient's concept of the shoulder, the entire pectoral girdle must be considered. Included as shoulder, then, are the supraclavicular area, the infraclavicular and pectoral areas of the thorax, the trapezius ridge and suprascapular regions, the deltoid region encompassing the point of the shoulder, the entire scapular region including the inferior angle or tip of the scapula, and the upper axilla (fig. 1).

There are several mechanisms by which extrinsic disease can be manifested as pain in the shoulder and upper extremity. The first of these lies in the fact that the cervicothoracic outflow of sympathetic fibers and ganglions emerges from the superior thoracic outlet. In addition, the brachial plexus traverses the superior thoracic outlet. Any disease process in the region of the pulmonary apex involving the neural structures named above thus can be manifested as pain in the shoulder and upper extremity (fig. 2).

Of greatest significance in the remote sources of shoulder pain are the diaphragm and phrenic nerves. Both superior and inferior surfaces of the

Because the word shoulder is used loosely by most patients, the location of a shoulder pain generally needs to be specified more exactly by the physician. He must next determine whether the cause is local or remote. A case history illustrates the puzzling results of repeated examinations of a painful shoulder in a woman who proved to have adenocarcinoma of the lung. Another patient, whose illness was ushered in by pain in the left forearm and hand, was found to have an intrathoracic tumor with partial destruction of two thoracic vertebrae. In the author's experience an extremely important common cause of shoulder pain is pulmonary infarction involving the diaphragmatic surface of the lung, but a variety of possibilities must be considered, including cardiovascular, intra-abdominal, and even genitourinary disease. The laterality of the pain must be kept in mind, and pain in the right scapular region, for example, suggests biliary disease. When disease is intrinsic in the shoulder, the pain is commonly felt in the deltoid region, where pain of visceral origin rarely appears.

diaphragm are supplied by phrenic afferent fibers originating most commonly in the third and fourth cervical segments. The long course of the phrenic nerves through the superior thoracic outlet along the pericardium extending the length of the entire mediastinum offers countless sites for disease to initiate afferent pain impulses. Furthermore, the broad areas offered by both superior and inferior surfaces of the central diaphragm constitute huge targets for disease to be manifested as pain in the shoulder (fig. 3). At this time it is appropriate to refer to the work of Capps and Coleman² who described both experimentally and clinically the localization of pain principally in the trapezius ridge resulting from stimulation of afferent sensory fibers in both superior and inferior surfaces of the central portion of the diaphragm. It is significant that in 23 cases of experimental stimulation and in 33 cases of diaphragmatic pleurisy, pain was appreciated only in the trapezius ridge, the supraclavicular region, and, in one instance, the area over the superior angle of the scapula. It should be noted that in

From the Division of Medicine, the Mason Clinic.

Read in the Symposium on the Diagnosis and Treatment of Pain in the Shoulder and Arm before the Joint Meeting of the Section on Orthopedic Surgery and the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

none was the pain localized lateral to the acromion.

As previously stated, the absence of local objective findings in the painful shoulder leads the physician to seek elsewhere for the cause of pain. Unfortunately, however, a reasonable search sometimes is unrewarding early in the course of a grave illness. A pertinent example is presented in case 1.

Report of Cases

CASE 1.—In June, 1957, a 42-year-old housewife and waitress sustained a blow to the right anterior part of her chest in a fall against a booth while at work. She stated that her wind was knocked out by the blow. One month after the injury, pain appeared in the lower posterior cervical region and in both shoulders. Several weeks later the pain became localized to the right shoulder and arm and forced her to seek medical consultation two months after the injury. At that time the pain was located chiefly at the point of the shoulder and at the radial area of the elbow.

An x-ray of the shoulder was considered within normal limits. In September, 1957, because of continued pain, an x-ray of the chest was made and considered within normal limits. Pain then was most severe along the upper right costochondral junctions. The physician attending her believed that the pain was the result of the injury. Two weeks later, because of continued pain, films of the thoracic spine were

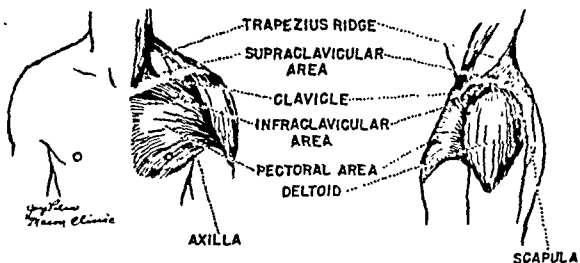


Fig. 1.—Anatomic regions referred to as shoulder by patients.

made, the only findings being hypertrophic changes. Treatment with cervical traction, phenylbutazone, prednisolone, and intravenously given procaine was of no avail.

Finally, in December, 1957, the patient was admitted to the hospital where physical examination disclosed tenderness of the right posterior part of the neck, scapular region, and infraclavicular area. Cervical compression caused moderate pain in the neck. Whenever the patient was in the erect position, pain in the right shoulder eventually forced her to lie down. An x-ray of the chest revealed a right upper mediastinal mass as shown in figure 4. Thoracotomy and biopsy confirmed the diagnosis of inoperable adenocarcinoma of lung.

The foregoing case record indicates difficulty in establishing diagnosis early in the course of an illness characterized by shoulder pain of pulmonary neoplastic origin. A second similar type of problem is apparent in the following patient whose illness first manifested itself as pain in the left forearm and hand.

CASE 2.—A 63-year-old furniture factory worker and former miner had been examined over a period of two years by the chest clinic of a city public health service. Typical nodular lesions of silicosis were found in the x-ray film of the chest (fig. 5), and repeated x-rays eventually revealed stability of these lesions. The last film was taken three months prior to the onset of the patient's illness, which was ushered in by

pain in the left forearm and hand and later by the development of Horner's syndrome on the left. A roentgenogram taken several months after the onset of the illness revealed a left apical intrathoracic tumor (fig. 6), and in a film of the spine destructive lesions of the transverse processes and bodies of the first and second thoracic vertebrae were seen (fig. 7).

In an attempt to arrive at a diagnosis a supraclavicular and an axillary lymph node were removed. Neither of these nodes manifested abnormalities which would suggest the

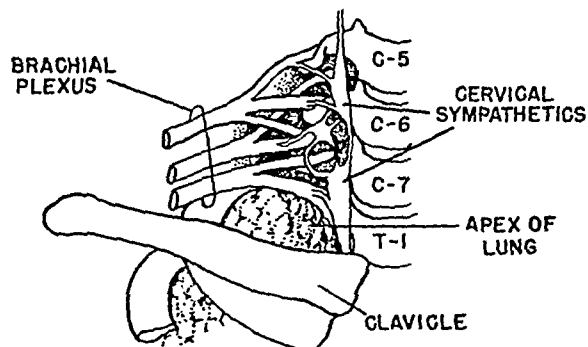


Fig. 2.—Location of cervicothoracic sympathetic outflow and brachial plexus in close relationship to pulmonary apex at superior thoracic outlet.

nature of the left apical tumor. Successful biopsy, however, was performed by means of a needle inserted into the region of the transverse process of the first thoracic vertebra. Microscopic examination of the tissue removed revealed a well-differentiated squamous cell carcinoma. The findings in this case were consistent with the diagnosis of a superior sulcus tumor that was inoperable because of neural and osseous involvement.

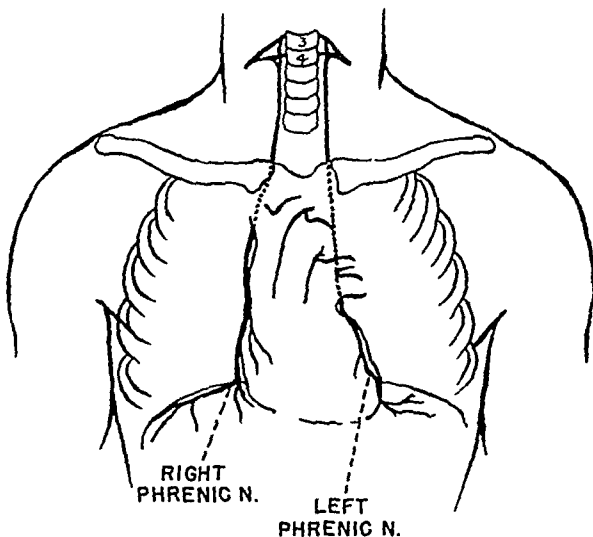


Fig. 3.—Long course through cervical and mediastinal regions and broad distribution of phrenic fibers to both superior and inferior surfaces of central diaphragm.

Comment

The pains in the two patients described above constitute examples of pain in the shoulder and upper extremity originating in malignant disease

of the respiratory tract and appearing in the shoulder and arm on the basis of involvement of brachial plexus and sympathetic outflow by the malignancy. The frequent occurrence of infectious respiratory illnesses with pleuritis involving the diaphragm is

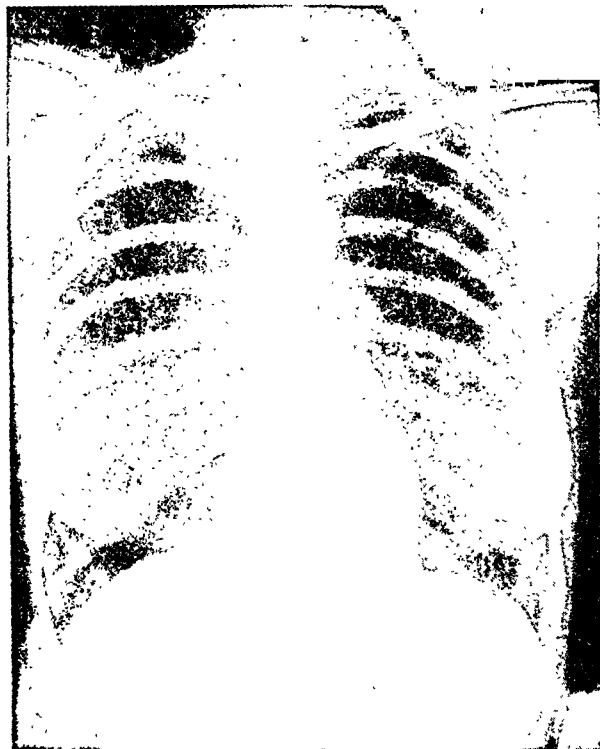


Fig. 4. (case 1).—Thoracic roentgenogram of woman who complained of pain considered due to an injury, until right upper mediastinal mass was discovered. Thoracotomy disclosed inoperable undifferentiated pulmonary adenocarcinoma.

not foreign to the practice of most physicians and deserves only mention here. An extremely important common cause of shoulder pain, as emphasized by Leland,³ is the pain of pulmonary infarction involving the diaphragmatic surface of the lung. In my personal experience this is one of the commonest shoulder pains of visceral origin. When a patient in the postoperative state or a patient with disabling injuries of the lower extremities encased in plaster, or fixed in traction, complains of pain in the shoulder, the diagnosis of pulmonary infarction is likely to be confirmed.

Diseases of the cardiovascular system offer many opportunities for pain in the shoulder and upper extremities, since the heart itself, the pericardium, the major vessels, and the peripheral vascular structures can be responsible. Ordinarily the pain of symptomatic coronary arteriosclerosis is located in the anterior central thorax, although the shoulders, upper extremities, neck, and jaw can be involved. In my experience patients with angina pectoris and myocardial infarction who complain of pain in the

arm and shoulder also almost always acknowledge anterior thoracic pain when specifically questioned. Although no hard rule can be applied, the usual site of pain in the shoulder and upper extremity is more likely to be left-sided, infraclavicular, and ulnar in location. This tendency to ulnar location is reasonable on an anatomic basis since the upper four thoracic spinal segments supply afferent pain fibers via the sympathetic pathways to the deep cardiac plexuses.

When the ascending aortic arch is involved with disease, pain tends to be appreciated in the right side of the neck and shoulder, and pain originating in the transverse and descending arch appears in the left side of the neck and shoulder.

As pointed out by Barker,⁴ peripheral vascular diseases causing pain in the arm and shoulder are accompanied by findings of significance. These consist of swelling, discoloration, prominent superficial veins, ulceration or gangrene of the digits, absent arterial pulsations, palpable thrombosed veins, abnormal coldness or warmth of skin, thrills, bruits, and pulsating masses. When appropriate physical findings are lacking, peripheral vascular disease is not likely to be the cause of pain in the arm and shoulder. Pain from most peripheral vascular diseases involving the upper extremity is apt to be in

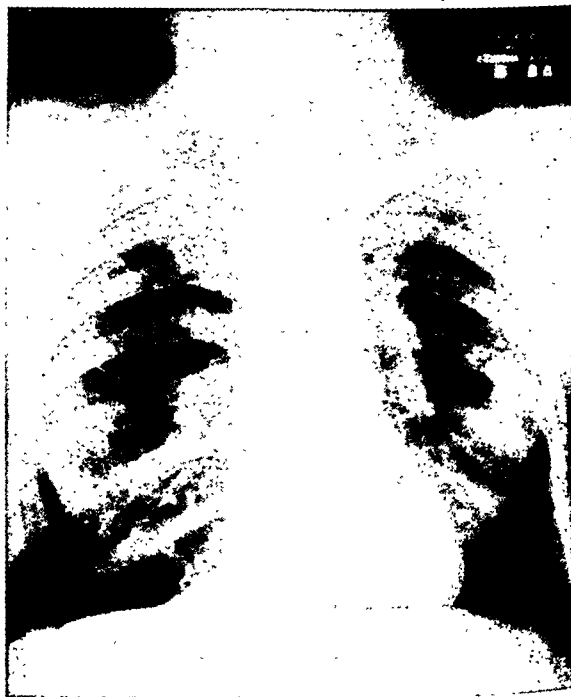


Fig. 5. (case 2).—Chest x-ray showing bilateral apical lesions considered to be consistent with diagnosis of silicosis.

the digits, e. g., Raynaud's disease, arterial occlusive disease, and erythromelalgia. In venous thrombosis and acute and chronic lymphangitis the arm and forearm are more likely to be diffusely involved in pain.

Diseases of the gastrointestinal tract may be responsible for pain in the shoulder. The esophagus, a perforated viscus, and the biliary tract are common sites of origin. Olsen⁵ calls attention to pain of diffuse esophageal spasm occasionally being referred to the arms. Hiatus hernia can mimic pain of cardiac origin with reference to the infraclavicular region and ulnar side of the arm (usually the left), but it also can be manifested as pain in the trapezius ridge when the mechanism of its production stems from central diaphragmatic irritation.

The perforated viscus is a common cause of referred pain in the shoulder, and the occurrence of pneumoperitoneum is the well-known sign of such an event. Not to be forgotten, however, is the pain in the shoulders caused by air in the peritoneal cavity resulting from any laparotomy. Pearce⁶ directs attention to the common reference of pain to either or both shoulders in perforated ulcer and mentions one instance of a patient with a posteriorly perforating gastric ulcer who lacked abdominal rigidity and whose pain was appreciated only in one supraspinous fossa.

The biliary tract possesses three mechanisms whereby pain can appear in the shoulder. Lewis⁷ has directed attention to the distribution of right

right trapezius ridge occurs in some instances of lesions of gallbladder and hepatic parenchyma. A second mechanism is the direct irritation of the central diaphragm as in liver abscess. The third type of referred pain is that of right scapular pain from disease of the gallbladder produced by stimu-

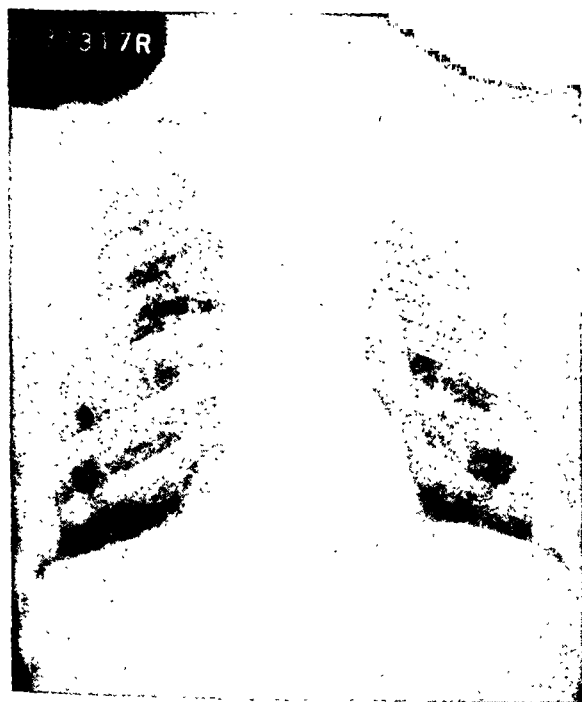


Fig. 6. (case 2).—X-ray revealing a large apical density, three months after onset of severe pain in left forearm and hand. This film was made less than one year after that shown in figure 5.

phrenic afferent fibers to the coronary and falciform ligaments, parts of the hepatic capsule, the gallbladder, and the liver itself. Hence pain in the



Fig. 7. (case 2).—Anteroposterior view of cervicothoracic spine. Destructive lesion at left second thoracic transverse process is shown.

lation of visceral afferent fibers in the major splanchnic nerve with central connections in thoracic segments 6, 7, 8, and 9. This referred pain, however, is almost invariably accompanied by deep epigastric discomfort. Lateralization of the viscera and their pain pathways makes the right shoulder the usual target for referred pain of biliary origin.

When disease of the pancreas is the cause of pain in scapular or shoulder regions, the reference of pain to these areas has been found to be a secondary extension of abdominal pain.⁸ The genitourinary tract introduces the factor of sex into a consideration of shoulder pain of visceral origin. In a woman in the childbearing years who complains of pain in the shoulder, the clinician must be alert to the possibility of intraperitoneal hemorrhage from ruptured ectopic pregnancy. The common target of the head of the humerus for metastases from carcinoma of the renal cortex deserves mention, since both the metastases and the primary lesion itself

can be very difficult to demonstrate early in the course of the illness. The above mentioned areas of predilection for shoulder pain of visceral origin are illustrated in figure 8.

Summary and Conclusions

Patients who complain of pain in the shoulder and arm are commonly encountered in medical practice. Whereas there are many causes for pain so located, two principal categories exist, local and remote. The differentiation of these two categories is not difficult, since the absence of objective findings at the site of pain leads one to consider remote causes.

Certain anatomic considerations are worthy of comment. The patient's concept of the shoulder is generally broad and includes the area of the entire scapula, the suprascapular region, the trapezius ridge, the supraclavicular fossa, the clavicular and

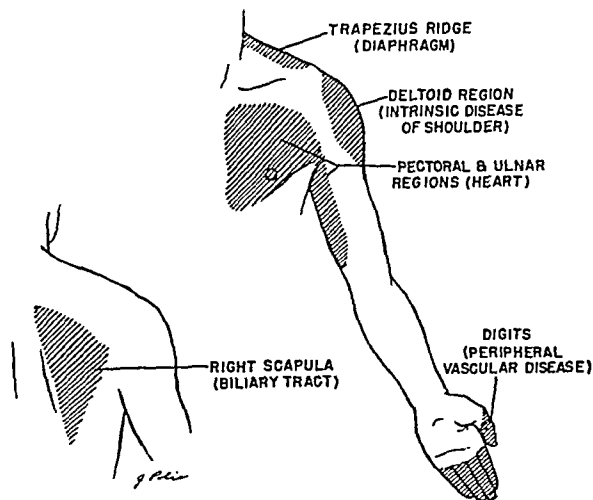


Fig. 8.—Usual sites of pain in shoulder due to remote causes.

infraclavicular regions, the pectoral region, the upper axilla, and the deltoid areas. Extrinsic disease can produce pain in the shoulder by involvement of the cervicothoracic outflow of sympathetic fibers or the brachial plexus at the superior thoracic outlet, as well as the phrenic nerves traversing longitudinally the entire mediastinum and supplying both surfaces of the diaphragm. Countless targets are offered to disease processes in the abdomen, thorax, and neck by the aforementioned neural pathways, any of which may yield pain in the shoulder. Two cases of apical pulmonary neoplasms in patients who complained of pain in the shoulder and upper extremity constitute examples of difficulty in discovering remote causes of shoulder pain, as well as examples of disease of the respiratory tract causing shoulder pain.

The role of diseases of the heart, great vessels, and peripheral vessels as causes of pain in the shoulder and arm is summarized as follows. The pain of myocardial ischemia is generally localized to the left pectoral region and the ulnar side of the left upper extremity. Peripheral vascular diseases are more apt to result in pain in the arm, forearm, and digits, accompanied by easily recognized findings.

Ordinarily the mechanism by which gastrointestinal diseases produce shoulder pain is by involvement of the central diaphragmatic surfaces. Hepatic pain referred to the shoulder can result from direct irritation of phrenic afferents in the hepatic plexuses. The factor of lateralization deserves attention, since hepatic and biliary pain generally are felt in the right trapezius ridge or scapular region.

Disease of genitourinary organs involves consideration of sex, since only women are susceptible to ruptured ectopic pregnancy, which often first manifests itself as shoulder pain. It is not uncommon for carcinoma of the renal cortex to produce shoulder pain by metastasis to the head of the humerus.

In conclusion, pain in the trapezius ridge is typical of diaphragmatic irritation either from intrathoracic, intra-abdominal, or pericardial disease. Pain in the left pectoral and ulnar areas is apt to be myocardial in origin. When the complaint of pain is localized to the digits, peripheral vascular disease must be considered. Pain in the right scapular region is suggestive of biliary origin. Rarely does pain of remote visceral origin appear in the deltoid region, the common site of pain due to intrinsic disease of the shoulder.

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SHOULDER PAIN

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and

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Any paper concerned with the shoulder cannot readily be written without a tribute to the late Dr. E. A. Codman.¹ Just prior to 1934, he wrote of shoulder pain as "difficult to define, difficult to treat, and difficult to explain from the point of pathology." While the difficulties were incompletely resolved, the stimulus for study was initiated. No longer can the diagnosis of "subdeltoid bursitis" be used with professional decorum and the affliction left to run a course aided or abetted with poultices, pills, and plaster. An understanding of the mechanics of the shoulder joint is essential in the proper diagnostic evaluation of the problem of shoulder pain and to an intelligent approach to its treatment.

The construction of the shoulder permits the arm to rotate 180 degrees, to swing in any plane through an arc of 180 degrees, and to combine these motions to permit reach to any point inside a hemisphere with a radius of equivalent length of the arm. The upper extremity is not unlike a moving boom crane (fig. 1). The body of the crane is the scapula; the scapula is tethered through an acromioclavicular joint to the clavicle which acts as an outrigger from the sternum to prevent the scapula from collapsing against the chest wall. The scapula glides, without a fixed track, along the chest wall—costoscapular motion. The fulcrum between the body of the crane and its 2-ft.-plus boom is a plum-sized sphere against a half-dollar-sized surface—the glenohumeral joint.

It should be emphasized that the arm lifts or supports weight more than half that of the body. Since the act of lifting involves motion of both the scapula and the humerus, one can readily visualize the necessity for firm stabilization of the scapulo-humeral joint. The glenoid does not accurately fit the humeral head (fig. 2); the contraction of the deltoid muscle without a fixed fulcrum effects a vertical pull on the humerus which snugs it under the acromion. Some type of stabilization of the shoulder must, therefore, take place to permit the deltoid muscle to raise the arm (fig. 3). This stabilization is effected by the muscles arising from the scapula which are attached with the shoulder capsule. As the scapular muscles contract, they fix the fulcrum between the humerus and the scapula. Abduction of the shoulder is initiated by the con-

Pain that is localized in the shoulder joint may be acute or chronic. The joint may be injured by either direct or indirect trauma. Some relief is afforded by ice bags, salicylates, and codeine during the acute stage, but an arthrogram may be necessary for precise diagnosis, and surgical repair depends on exact understanding of the anatomy. Musculotendinous lesions, while frequently induced by acute trauma, tend to attain chronicity in patients over 40 years of age. Frequent findings in the chronically painful shoulder are calcification of the joint capsule and pericapsular structures, bicipital tendinitis, and immobilization of the joint by pericapsulitis and periarthritis. Pain not localized in the shoulder but referred to it has a number of possible causes, including structural abnormalities and trauma to the cervical part of the vertebral column. These may often be treated with success by means of traction, supportive collar, posture, and carefully prescribed exercise.

traction of the supraspinatus, then the infraspinatus, and the teres minor. As the deltoid contracts, its vertical pull is opposed by the teres major, subscapularis, and the tendon of the long head of the biceps. Any disparity in the balance of the scapulo-humeral muscles may result in shoulder disability.

Local Causes of Shoulder Pain

Local causes of shoulder pain may be from direct or indirect trauma. Direct trauma most frequently is associated with fracture of the clavicle, dislocation of the acromioclavicular joint or sternoclavicular joint, fracture of the surgical neck of the humerus, fracture of the acromion, or of some portion of the scapula. Indirect trauma results in dislocations of the shoulder, tear or rupture of sections of the shoulder cuff, or fractures through the anatomic neck of the humerus.

Traumatic injuries, with the exception of shoulder cuff tears, are readily visualized by x-ray examination. Major cuff tears, however, may be determined by arthrogram. Immediate recognition and treatment of traumatic injuries, including the supervision of prescribed, graduated exercises for restoration

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Read in the Symposium on the Diagnosis and Treatment of Pain in the Shoulder and Arm before the Joint Meeting of the Section on Orthopedic Surgery and the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

of shoulder function, will in most instances yield good or excellent functional results, with seldom any significant permanent partial disability.

Acute sprain of the supraspinatus tendon is treated by a sling and swathe or by a Velpeau bandage. If after local infiltration of procaine the arm cannot be abducted, the arm is best held in an

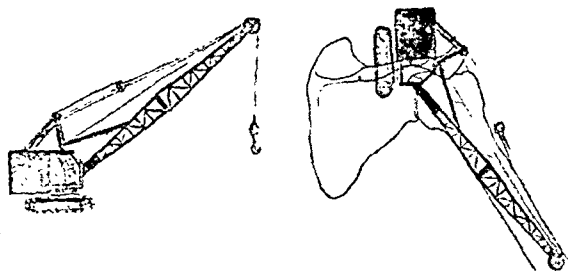


Fig. 1.—Comparison of shoulder to boom crane.

abduction splint. If there is further reason to suspect that there is a cuff tear of sufficient extent to prevent the abduction, an arthrogram is indicated (fig. 4). The more extensive tears are surgically repaired. With acute shoulder pain, application of ice bags locally is better tolerated than heat. Salicylates every fourth hour during the day, and codeine, or its equivalent, at night are generally necessary. Exercise consisting of removing the sling and swathe and bending forward, allowing the arm to drift into a flexed position, is indicated during the first few days and should be repeated 5 to 10 times three or four times daily. As acuteness subsides, a pendulum exercise may be started. As the flexion of the arm with gravity eliminated reaches approximately 110 degrees, overhead pulley exercise may be instituted. No exercises in the lateral plane or exercises which involve rotation of the shoulder joint are permitted until a full 180 degrees' elevation in the anterior plane is attained.

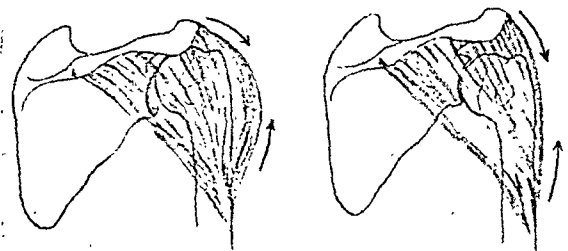


Fig. 2.—Without fulcrum, deltoid muscle fails to abduct arm.

Musculotendinous lesions, while frequently induced by acute trauma, have a tendency to attain a state of chronicity in individuals over 40 years of age. This chronic state may come about through misunderstanding by the patient and the physician of the importance of guided rest and graduated exercises after injury. The repetition of minor

strains enhances synovial reaction, muscle spasm, tendon contracture, and capsular adherence. These may be very subtle and may occur without acute trauma after such endeavors as struggling to locate the sleeve of a heavy coat with the left hand during the first few days of cold weather, a few hours of painting a ceiling, or a session of curtain hanging.

Causes of Chronic Shoulder Pain

The following lesions are most frequent causes of the chronic, painful shoulder: calcification of tendons of the shoulder cuff, bicipital tendinitis, and "frozen shoulder."

Calcification.—Calcification in the shoulder cuff is apparent on x-ray examination and may vary in size from a fleck to a mass of material which may be two or more centimeters in diameter. The calcification, while usually located near the region of insertion, and within the fibers of the supraspinatus tendon, can occur within the shoulder cuff near the attachment of the infraspinatus, the teres minor, or the subscapularis tendons. The calcifications with acute symptoms are generally soft and

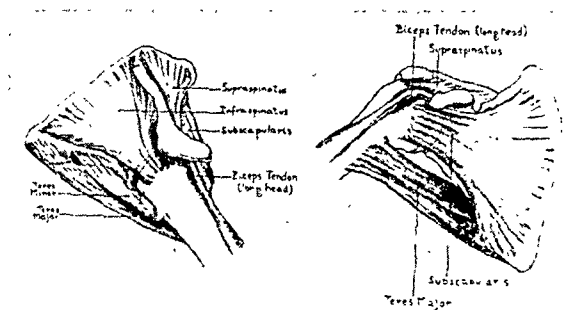


Fig. 3.—Diagrammatic representation of musculotendinous stabilization of shoulder showing view from, left, above and, right, front.

creamy in consistency. Those of longer duration are likely to be granular. Olsson² has stated that the histories obtained from records of patients on whom he performed autopsy gave no relation of shoulder symptoms to the amount of degenerative changes that he found in the capsule of the shoulder joint. DePalma,³ from autopsy material, previously reached a similar conclusion.

Our clinical experience with living patients tends to verify this. On radiographic examination the presence and even the extent of calcification bears no direct correlation to the symptomatology. When there is a symptomatic calcification of the shoulder cuff, an attempt is made to aspirate the calcified material, and hydrocortisone, 25-50 mg., is introduced into the area. It is frequently necessary to repeat this injection of hydrocortisone after five days. In our experience, it is seldom necessary to surgically remove the calcifications. Bosworth,⁴ however, after an extensive case study concluded that any calcification larger than 1.5 cm. in diameter will eventually be symptomatic and that the larger

the calcification the greater the incidence of surgical removal. We believe, if surgical removal of calcifications is undertaken, it is advisable to hold the arm, after operation, in neutral rotation and 90-degree abduction with balanced suspension (fig. 5).

A diffuse calcification of the shoulder cuff or an exostosis of the acromion can be responsible for impingement when the arm is brought into the abducted position. Excision of the acromion as advocated by Smith-Petersen⁵ has been the treatment of choice (fig. 6).

A subdeltoid bursitis, as such, practically does not exist as a cause of shoulder disability. It is, however, possible for the subacromial bursa to be involved secondarily. This has been found where there has been tearing of the shoulder cuff or rupture of a calcific deposit. At times when an old extensive cuff tear is explored, the entire subdeltoid area may be filled with increased fluid, multiple loose cartilaginous bodies, and a chronic villous synovitis.

Bicipital Tendinitis.—Bicipital tendinitis, first described by Hitchcock and Bechtol,⁶ presents local tenderness in the bicipital groove, pain with active use of the biceps, or passive stretching of the biceps tendon. As has already been mentioned, the biceps tendon plays a major part in the stabilization of the humerus when the deltoid muscle contracts to elevate the humerus. The tendinitis generally responds to local infiltration with hydrocortisone. It is necessary to prevent extension or external rotation of the shoulder joint until the tendinitis has subsided. At night, for comfort, it may be advisable to have the patient wear a sling and swathe in order to maintain the elbow in the region of the umbilicus. This position relieves stretch on the bicipital tendon as well as on the supraspinatus tendon. During the day, exercise is encouraged as tolerated. In resistant

humerus. If this procedure is carried out, it is recommended that the contracted proximal portion of the tendon extending to its insertion at the glenoid be divided or removed.

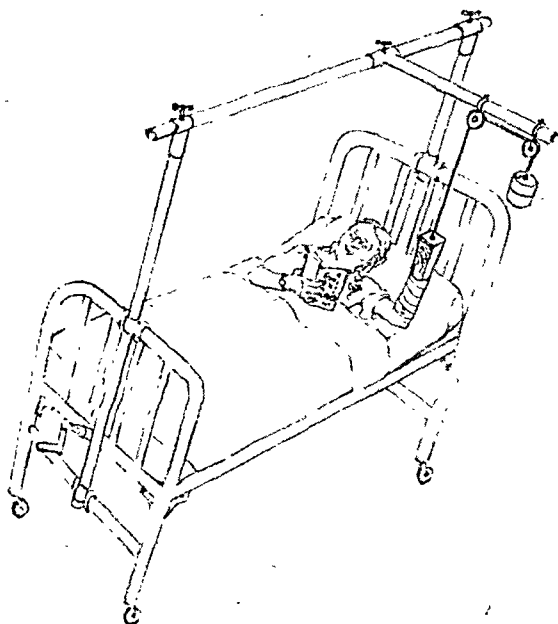


Fig. 5.—Type of traction used for painful or stiff shoulders.

"Frozen Shoulder."—The term frozen shoulder, while descriptive, is not a scientific one. Pericapsulitis and periarthritides are terms utilized for the same symptom complex. The condition results in a loss of scapulohumeral motion. The subject complains of pain which is more or less continuous, particularly pronounced when lying down, and occurring with any attempt to utilize the corresponding hand to work zippers or buttons at his back. The x-ray study will show a higher relationship of the head of the humerus to the glenoid, and, depending on the duration of symptoms, there may be considerable bone atrophy. The "frozen shoulder" frequently is associated with the hand syndrome. Here, depending on the stage of evolution, there may be swelling of the hand, shininess of the skin, a loss of the normal concavity between the metacarpal heads on the dorsum of the hand, and atrophy of the intrinsic muscles; there will consistently be loss of motion in the metacarpophalangeal and the interphalangeal joints. On the palmar surface of the hand, there is apparent, late in the course, a nodularity in the fascia similar to that found with Dupuytren's contracture.

Coventry⁷ refers to a "periarthritic personality." Such persons have a history of numerous illnesses; they are almost always accompanied at the time of office visit by one or more others, frequently not members of their family. The pathology of the "frozen shoulder" reveals an adherent capsule which is contracted; this tends to fix the shoulder. Under direct visualization, it is found that the sub-



Fig. 4.—Arthrogram of shoulder showing, left, rupture of cuff and, right, cuff after repair.

cases in which the x-ray shows a higher position of the head of the humerus in relation to the glenoid, it may be advisable to divide the transverse humeral ligament or to perform a tenodesis of the long biceps tendon to the bicipital groove of the

scapularis muscle must be divided, the long biceps tendon must be freed, and the teres major and the pectoralis major must be partially released from their insertions to the humerus to permit external rotation. The inferior capsule of the joint must be

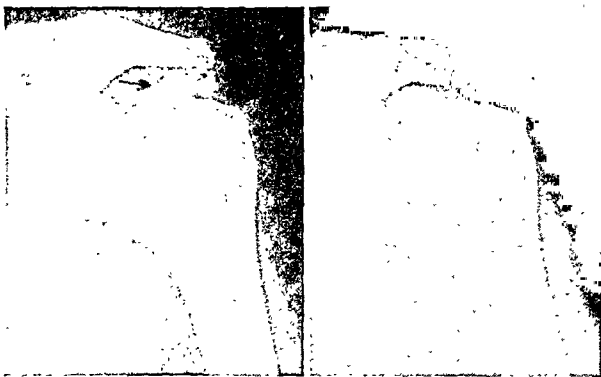


Fig. 6.—Left, exostosis of acromion as cause of subacromial bursitis. Right, four months after acromioplasty.

divided to obtain abduction. The joint is dry. It has been our experience to find that, even though the shoulder is held in abducted position for as long as six weeks after operation, and endeavors made to utilize the muscles in the abducted position, these patients tend to contract down as soon as the abducted position is abandoned.

It is our opinion that bed rest with balanced traction and suspension is a better method of handling resistant cases than to attempt manipulation or open surgery. Exercise can be more effective by utilizing a weight in the hand of the involved side and gradually increasing the swing of the hand as a pendulum in the forward plane after eliminating gravity by forward flexion of the trunk (fig. 7). Overhead pulleys should not be used until a relative elevation of 110 degrees of the shoulder is attained.

If symptoms are not too severe, they are best treated with a sling and swathe at night, encouragement in repetition of pendulum exercises during the day, and cortisone, as recommended by Coventry, in dosages which may be 25 mg. four times daily for the first week, cutting down to three times daily the second week, twice daily the third week, and then 25 mg. daily in divided doses. This may have to be continued for a period of 8 to 10 weeks.

Causes of Referred Pain

The causes of referred pain to the shoulder are neurogenic; visceral; structural from cervical spine; postural; traumatic, involving cervical spine, clavicle, or sternoclavicular joint; or peripheral lesions. Since other members of the panel are discussing the neurogenic and the visceral types of pain in relation to shoulder conditions, we will discuss first the structural type of difficulty.

Structural Causes.—In the cervical spine, hypertrophic exostoses may narrow the intervertebral foramen and cause pinching of the cervical nerve roots. Accompanying these changes, there may be

deterioration of the disks between vertebral bodies with narrowing of intervertebral spaces. This results in fixation of the involved bodies, and the vertebral body above or below the area of fixation will be found to have more motion than normal (fig. 8). This may result in a vertebral subluxation and pinching of the corresponding nerve. In addition, the degenerated cervical disk may become pushed backward and give pressure against the nerve root.

These conditions are best handled by traction on the head to relieve the pressure on the roots; cervical collar; instruction in head posture; measures which will maintain that posture, such as hard, flat bed, no pillow at night, elevated desk for reading and work, "bed specs," or "reclino specs" (prisms) for reading in bed; and exercises which will train the patient to turn or flex his head in but one plane at a time. These exercises also strengthen the cervical spine muscles and prevent fatigue and resultant faulty skeletal posture. Overenthusiastic surgeons must be cautioned against removal of a cervical disk when shoulder pain is the major complaint. Conservative measures as outlined so frequently give complete relief of symptoms; they should be continued several weeks, even in the presence of neurological signs, before a disk operation is decided on. It has been our experience to find that patients not relieved of symptoms by surgical removal of a disk were benefited by conservative measures in the way of traction, support, and exercise.

Postural Causes.—Postural causes of cervical spine lesions to be regarded are the tension syndrome and "drooping shoulder." The patient with

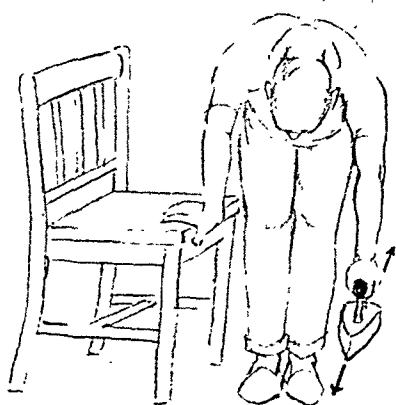


Fig. 7.—Method of distracting shoulder joint and obtaining flexion.

tension syndrome leads with his chin and stands with posterior neck muscles drawn taut. These patients, again, must be treated by a regimen similar to that used in those patients with structural deformity of the cervical spine. The response is always most gratifying. "Drooping shoulder" is frequently

associated with pain in the region of the superior angle of the scapula and tenderness over the attachment of the levator scapulae. Treatment by injecting the "trigger point" area with 2 cc. of 2% procaine solution, while frequently rewarding, should be supplemented to insure permanency by correction of posture and measures which will build up the musculature of the upper back, such as extension exercises and bell-bar exercises above the head.

Causes Due to Trauma.—Trauma involving the cervical spine which results in impaired motion, deformity with its resultant postural imbalance, or disturbance of nerve roots obviously may be accompanied by shoulder pain. The treatment of this is ordinarily along the lines already outlined. If instability of the cervical spine is present, surgical stabilization (arthrodesis) may be required.

Disturbance of the sternoclavicular joint by injury or disease may result in shoulder pain, with or without local pain at the involved joint. Dislocation of the sternal end of the clavicle requires surgical

do not respond adequately to the treatment above outlined for sprains and minor subluxations may be treated by resection of the distal 0.5 in. of the clavicle, being sure not to disturb the integrity of the coracoclavicular ligaments.

Peripheral lesions of an extremity are frequently the cause of shoulder-hand syndrome. A fractured wrist or a suppurative lesion of the hand may result in a prolonged period of splinting, the arm resting in a sling. This leads to edema, tenseness of the skin, stiffness of the fingers, and a loss of shoulder motion. Accompanying this is causalgia and underlying osteoporosis of bone. A similar picture may be produced by vascular disease, such as thrombophlebitis, diffuse vasculitis, or periarteritis nodosa. The residual syndrome is not unlike that of the "frozen shoulder," and the resistance to treatment is similar.

Moberg⁸ believes that this syndrome is not due to a sympathetic nervous system response, since it is almost never seen in the young, seldom in persons under 40 years of age. He claims the situation

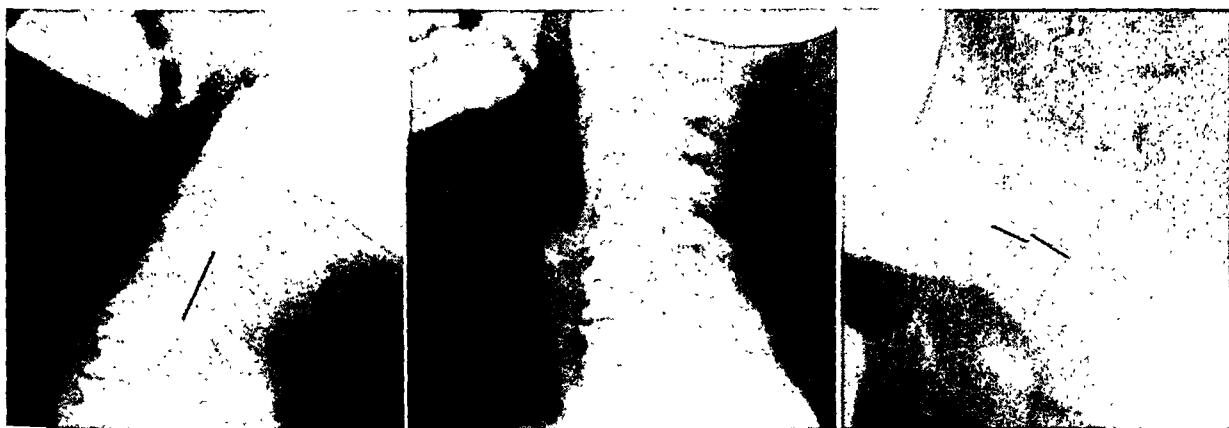


Fig. 8.—Unstable 4th cervical vertebra on fixed 5th, 6th, and 7th vertebrae (to which shoulder pain was attributed in 57-year-old woman) showing, *left*, extension, *center*, neutral position, and, *right*, flexion.

repair. Minor subluxations and sprains of this joint will usually respond quite satisfactorily to a period of rest, intra-articular hydrocortisone therapy, and progressive exercise starting 7 to 10 days post injury. Involvement of this joint by chronic infection or neoplasm may call for resection of the involved proximal end of the clavicle. Fractures of the clavicle of themselves rarely cause any lasting shoulder problem, provided the shoulder motion is maintained by active exercise with gravity eliminated, as outlined in the treatment of acute shoulder sprains.

Injury to the acromioclavicular joint may initiate a frozen shoulder, due to voluntary immobilization because of pain. Sprains and minor subluxations of this joint will usually respond well to brief rest, intra-articular hydrocortisone therapy, and progressive active exercise as previously described. Complete dislocation of the joint, by interfering with the outrigger support of the shoulder girdle, will result in weakness of the shoulder joint and should be surgically repaired. Degenerative joint changes that

could have been prevented if the patient had been cautioned as to the necessity of using the fingers and of getting the shoulder to move from the beginning. In the majority of cases, this is true. Certainly after the condition has occurred, there is a prolonged period of disability due to the hand from contractures of the metacarpal-phalangeal lateral ligaments and due to the changes which have taken place in the shoulder joint itself. We have found on occasion that stellate block, as recommended by Steinbrocker,⁹ repeated at intervals over a period of two to five weeks, results in improvement during the earlier stages.

It is important that we all teach that peripheral lesions must be treated with elevation and with the position of function of fingers and hands maintained. Active exercises of fingers must be performed as soon as possible in order to rid the hand of edema and to prevent contracture of the ligaments of the fingers. All shoulders must be carried through a range of motion at least twice daily to prevent contractures of the capsule from occurring. There is no

glory for the physician who attains a perfect reduction of a Colles fracture and must spend six months to a year encouraging his patient to limber up stiff fingers and a "frozen shoulder."

Conclusions

The shoulder joint is dependent on tendon insertions and a balance of the scapular humeral muscles for function and stability. The early recognition of injuries to the tendinous-capsular cuff, treatment by splints or surgical repair, and management of arm injuries with elevation and neutral position of joints, followed by early graduated exercise for all joints, including the fingers of the extremity, results in early rehabilitation.

Pain may be referred to the shoulder from several body areas. The resultant splinting of the shoulder produces the same persistent "hand-shoulder syndrome" that is associated with a shoulder lesion. Management of certain cervical spine lesions by traction, supportive collar, head posture, and neck exercise has proved advantageous when shoulder pain has been the chief complaint.

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PHYSICAL TREATMENT OF THE PAINFUL ARM AND SHOULDER

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Physical therapy can be most effective in providing relief from pain in the shoulder and arm. Such treatment varies considerably, depending on the cause of pain in this area; therefore, an accurate diagnosis of the underlying pathological condition is of primary importance.

The circumstances at the time of onset of pain should be ascertained: for example, gradual or sudden onset, presence of other symptoms such as limitation of shoulder motion, and association with unusual physical activity, injury, illness, exposure to cold, or emotional upset. The patient should be questioned concerning localization of pain and factors tending to aggravate or to relieve his distress. In the examination, the physician must give special attention to the neck, shoulders, and upper extremities, noting any postural abnormality, suspicious swelling, tenderness, muscular spasm, increased warmth, abnormal sweating, and muscular atrophy.

Treatment of a painful shoulder should be preceded by careful diagnostic study. It is convenient to divide the pathological conditions that can cause pain in the shoulder into those that do and those that do not cause limitation of shoulder motion. Wherever feasible, physical therapy is directed toward the cause of the pain. For maximal effectiveness from physical therapy, the treatments should be administered by a fully qualified physical therapist. The physician who prescribes such treatment must exert sound clinical judgment in selecting the specific procedures to be utilized and the frequency and duration of the treatment so that the desired results can be achieved without exceeding the physical tolerance of the patient.

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Read in the Symposium on the Diagnosis and Treatment of Pain in the Shoulder and Arm before the Joint Meeting of the Section on Orthopedic Surgery and the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 27, 1958.

He must test sensation, deep tendon and superficial reflexes, and range of joint motion. Finally, he should perform certain special tests that might be

indicated, such as the outlet maneuvers, downward pressure on the vertex, and upward traction under the chin and occiput. Roentgenograms of the chest, shoulder, and cervical spine will usually be required as part of the diagnostic study.

Pathological Conditions Without Limitation of Shoulder Motion

Frequently, pain that is referred to the arm and shoulder is not caused by any direct involvement of these structures. The following conditions can be included in this category: (1) cervical radiculopathy, in which a cervical nerve root is compressed by an osteophyte, by protrusion of an intervertebral disk, or by primary or secondary neoplasm; (2) cervicothoracic outlet syndrome, in which the brachial plexus, subclavian artery, and subclavian vein may be stretched or compressed by a cervical rib, by hypertrophied scalenus anterior muscle, by enlarged transverse process from the seventh cervical vertebra, or by some other mechanism; (3) necklash injury; (4) muscular strain, in which I include the fibrositic syndrome, which is related to faulty posture or to increased nervous tension; and (5) visceral disease. The common characteristic of these five conditions is the absence of limitation of shoulder motion.

In these pathological conditions, physical therapy is directed toward the cause of rather than the area of referred pain. Treatment is of course individualized, but the programs of physical therapy can be summarized briefly as follows:

Cervical Radiculopathy.—Physical therapy is strikingly effective in relieving irritation of a cervical nerve root by a bony spur in osteoarthritis of the cervical spine. Local heat for 30 minutes and sedative massage are applied to the neck and shoulder, followed by posture training, mild strengthening of the erector spinae and the rhomboid muscles, exercises attempting normal range of neck motion, and cervical traction, applied by the Sayre head halter with the patient in a sitting position. Treatments are administered two or three times weekly in the physical therapy department for about a month; in addition, the patient is given a head halter and instructed to carry out treatments daily at home, providing another person is available to assist him. Cervical traction, which is the most important part of the program, is applied for relatively short periods (usually 3 to 5, and not longer than 10, minutes) at tensions of 25 to 60 lb. in the department (20 to 30 lb. at home). Advanced age should not be considered a contraindication to cervical traction, although traction should be applied with greater caution in elderly persons.

When there is compression of a cervical nerve root by protrusion of an intervertebral disk and there are no serious neurologic deficits, surgical decompression should not be attempted before an adequate trial of physical therapy. Frequently, such conservative treatment will provide complete relief. The program of physical therapy is the same as that outlined for cervical osteoarthritis except that treat-

ments are given once or twice daily and the patient generally is hospitalized for closer observation.

Physical therapy is not indicated in treatment of pain from primary or metastatic neoplasm in the neck if there is some hope of cure by surgical excision or by irradiation. However, when the disease has progressed beyond this stage, radiant heat and gentle massage to the neck and upper part of the back are often effective in relieving pain. No heat should be given to areas where sensation is impaired: for example, by cordotomy or posterior rhizotomy. Caution should be used in treatment so as not further to traumatize tissue that has been irradiated.

Cervicothoracic Outlet Syndrome.—Physical therapy is the treatment preferred when there is evidence of compression of neurovascular structures in the cervicothoracic outlet, which is the region in which the brachial plexus and subclavian artery and vein leave the neck and thorax and are transmitted to the upper extremity. Many physicians now believe that no patient should be subjected to section of the scalenus muscles, removal of a cervical rib or part of the clavicle, or exploratory operation in this area without first receiving an intensive program of physical therapy for a period of one to three months.

The program of treatment consists of local heat and massage when necessary to relieve pain and muscular spasm, posture training emphasizing the so-called neutral position for the shoulders, strengthening of muscles that elevate the shoulders, and posture exercises to strengthen the erector spinae and the rhomboid muscles. Patients with outlet syndrome should be cautioned not to sleep with their arms above the head and to avoid activities that aggravate their symptoms. After such a program of physical therapy, only a small percentage of patients will require surgery.

Necklash Injury.—In necklash injury, which frequently results from rear-end automobile collisions, the patient occasionally complains of pain radiating from the neck into the shoulder and arm. Physical therapy should be part of a program of symptomatic treatment and reassurance by the physician designed to avoid a crippling psychological fixation that can occur in some cases in which there is compensable injury and fear of progressive disability. For this reason, physical therapy should be instituted as soon as possible after the injury. The program includes local heat, sedative massage, posture training and exercises, normal range exercises for the neck emphasizing relaxation, and cervical traction.

Typically, treatments are scheduled in the physical therapy department two to three times weekly for one or two months. Toward the end of this period the frequency of treatment is gradually reduced, but the patient is instructed to continue a program of therapy at home. It is important not to overtreat these patients. They should be urged to settle any pending litigation within a reasonable period, for example, 18 months.

Muscular Strain.—Increased thoracic kyphosis, sloping shoulders, and forward position of the head are postural faults that can cause chronic muscular strain resulting in a dull aching pain radiating from the neck into the shoulders and upper part of the back. Nervous, anxious persons often unconsciously tense muscles in this area; prolonged muscular contraction frequently results in tension myalgia, or the so-called fibrositic syndrome, that characteristically becomes more severe later in the day and during periods of emotional stress. In muscular strain due either to faulty posture or to increased nervous tension, physical therapy can be of considerable help. Treatment consists of local heat; massage; posture training; exercises to strengthen the erector spinae, the rhomboid, and the shoulder elevator muscles; and exercises to increase relaxation in the neck and upper part of the back.

Visceral Disease.—When pain in the shoulder and arm is caused by disease in the thorax or in the abdomen, and there is no limitation of shoulder motion, physical therapy obviously can be of no help and is, therefore, not indicated.

Pathological Conditions with Limitation of Shoulder Motion

Pain in the shoulder and arm associated with limitation of motion is found in many cases in which there is primary or secondary pathological involvement of the musculoskeletal or soft-tissue structures in the shoulder girdle. These pathological conditions can be listed as follows: (1) peri arthritis, which includes calcific peritendinitis, rupture of the rotator cuff, the bicipital syndromes, and bursitis; (2) shoulder-hand syndrome, which is a reflex sympathetic dystrophy, caused by a wide variety of conditions, such as causalgia and myocardial infarction; (3) arthritis (most commonly rheumatoid arthritis, rarely osteoarthritis); (4) contractures due to immobilization (for example, after application of cast, radical mastectomy, or paralysis); (5) acute trauma (sprain, fracture, or dislocation); (6) peripheral neuropathy (having a toxic, herpetic, or traumatic cause); and (7) miscellaneous (infection, neoplasm).

When physical therapy is indicated in these conditions, it is directed primarily to the shoulder and arm for the purposes of relieving pain and muscular spasm, of improving circulation and local tissue metabolism, and of restoring range of joint motion, muscular strength, and function in the upper extremity. In the various types of peri arthritis, in shoulder-hand syndrome, in rheumatoid arthritis or osteoarthritis, and in contractures after immobilization, very similar programs of physical therapy to the shoulder are followed: local heat, deep stroking and kneading massage, active and active assisted exercises, and gentle stretching to increase range of motion, posture training, and posture exercises.

In patients who have extremely painful limitation of shoulder motion, a special type of active exercise, first described by Codman, is often given.

The patient bends slightly forward at the waist and swings his arm like a pendulum first in clockwise, then in counterclockwise, rotary motions, gradually increasing the arc of movement as tolerated. Frequently, the program is supplemented with exercises utilizing the shoulder ladder and overhead pulley and with occupational therapy directed toward increasing functional abilities, muscular strength, and coordination.

In some cases of acute peri arthritis and in acute trauma to the shoulder, when there is evidence of bleeding into the soft tissues, cold is applied to the shoulder in the form of either moist cold compresses or an icebag. In peripheral neuropathy, local heat is not usually effective and may make the patient more uncomfortable; if sensation is impaired, heat of course must not be applied. In an acute infection, such as a thrombophlebitis, warm moist compresses are helpful, but massage and exercises to the involved areas are contraindicated. No physical therapy is given when there is neoplastic involvement of the shoulder or arm.

Factors Involved in Effective Physical Therapy

Frequently, the question is asked: "Which form of heat is most effective?" Perhaps in the past, too much importance has been attached to the specific type of heat utilized. Actually, heat is the same, regardless of the source; whether it is emitted from hot water, an electric pad, diathermy cables, the sun, or a heat lamp, heat is simply energy that can increase molecular motion.

Considerations that should determine the specific form of heat to be used in a given situation are as follows: depth of penetration desired, subjective response of patient, availability of source, and safety in application. Sources of rather limited penetration are radiant heat (luminous infrared heat lamp, nonluminous coil heater) and conductive heat (hot water bottle, hydrocollator pack, electric pad, and hot moist pack). When the patient is expected to follow a home program of treatment, the luminous infrared heat lamp presents many advantages; it is inexpensive, very safe to use, simple to operate, and readily available at any electrical appliance store. If the patient objects to the glare from such a lamp he should be instructed to buy one made of red glass. He should be cautioned not to purchase a sun lamp, which emits considerable ultraviolet radiation; 30 minutes exposure to such a lamp will result in a serious burn.

Contrary to the general public's impression, the electric pad is a potentially dangerous source of heat because patients frequently apply it for long periods; serious burns, even when the pad is set on "low," have resulted when the person using this device falls asleep. After a few years, the insulation covering the wires in an electric pad cracks, resulting in short-circuits with electric shock and fire hazards. Actually, the hot water bottle or hydrocollator pack is preferred to the electric pad as a convenient and safe form of heat application for use in the home.

Sources providing deeper penetration of heat are short-wave and microwave diathermy. If the patient is able to come in for a series of treatments in the physical therapy department, diathermy is given in preference to other forms of heat because of its depth of penetration. If the area of discomfort is localized, microwave diathermy can be applied most conveniently. If the discomfort is more generalized over the neck, upper part of the back, shoulder and arm, short-wave diathermy coils can provide more effective, uniform heating.

In recent years, ultrasonic diathermy has come into general use in departments of physical therapy. This is a type of vibrational energy of high frequency which causes selective heating at interfaces within a body. Its exact role in the treatment of various pathological conditions causing pain in the shoulder and arm is still not completely clear. However, there is evidence that it is helpful as an adjunct in the treatment of periartthritis of the

shoulder and causalgia.¹ When given, it is applied for periods of 5 to 10 minutes at intensities up to 1.5 watts per square centimeter, utilizing the so-called stroking technique; the application should be followed by massage and exercises such as those described previously.

For maximal benefit from physical therapy, the treatments should be given by a fully qualified physical therapist. The physician who prescribes physical therapy must exert sound clinical judgment in selecting the physical procedures to be utilized and the frequency and duration of treatment so that the desired results can be achieved without exceeding the physical tolerance of the patient.

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POTENTIAL FOR REHABILITATION IN QUADRIPLEGIC TEEN-AGERS

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The potential for rehabilitation in patients with high spinal injuries is directly related to the extent of cord severance as well as to adequate management.¹ In the past a majority of patients with such injuries have been 20 years of age or older, but of recent years much younger quadriplegics are being admitted for rehabilitation services.² Because of an elevation in the birth rate, increasing recreational pursuits, and the rising number of automotive accidents these disabilities are expected to become more numerous.

Teen-agers have a potential for adjustment and growth which will never again be as great in terms of rehabilitation. Their pattern of development during these critical years determines their place in the adult working world. Neglect during this pivotal experience point may create physical and emotional maladjustments which can be costly to the individual and to society, but in view of the current advances in physical medicine and rehabilitation, we can give these boys and girls a reliable new scale of values and serenity of spirit.³ The money we spend on fitting them for years of useful living gives recognition to the capacities of all our disabled citizens, young as well as old.⁴

The extent of recovery and rehabilitation after quadriplegia has been studied in 12 patients, 8 of them victims of accidents with motor vehicles. Three detailed case histories illustrate the difficulties encountered and the extent of self-care, educational attainments, and vocational prospects found in these patients. Although adolescence is a pivotal experience it is possible to give young people a reliable new scale of values and a serenity of spirit. The level at which the spinal cord was injured is all-important in deciding the prognosis. The second consideration is early expeditious comprehensive therapy. The third consideration, age, favors the adolescent in that he is more cooperative than young children and less hampered by ingrained traits than the aged. He must cooperate in giving attention to his skin and urinary and neuromuscular systems, and, above all, he must learn to rely as much as possible on his own capabilities.

Patients Studied

In a two and one-half year period, 12 patients with cervical cord transections were followed by personnel in the department of physical medicine

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Read before the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

at the University Hospitals of the University of Oklahoma School of Medicine. All the disabilities sustained were traumatic in origin; their causes were automotive accidents (eight), diving injuries (two), fall from window (one), and trampoline accident (one). Two, or 17%, were female, of whom one was an adolescent, and 83% were male. Six, or 50%, were patients in their teens. The adults were used as a comparative group in terms of their rehabilitation potential (see table). Each patient was seen on consultation as soon as he could be referred from either the orthopedic or the neurosurgical services. After a thorough physical medicine evaluation, including social and psychological assessment, definitive rehabilitation programs were prescribed for them.

In this paper quadriplegia is used to mean the permanent partial or total paralysis of those spinal cord elements affecting the upper limbs in addition to paralysis of the lower extremities. Since the lower fibers of the brachial plexus consist largely of

indicated, for the quadriplegic teen-agers is in four categories: negligible, poor, fair, and good. "Negligible" meant that the prognosis was exceedingly doubtful; "poor," that complications were present and that the patient was confined for the most part in bed and was able partially to feed himself; "fair," that there were few complications, wheel chair mobility was possible, and the patient was almost independent in feeding himself; "good," that there were no complications for at least three months and that the patient could use a wheel chair moderately well, was able to feed himself, and could stand in braces and crutches.

It is rare for quadriplegics to ambulate for any distance. Teen-agers with fair to good potential can continue their education at high school, college, or through correspondence courses and have an optimistic outlook in terms of a vocation. All but one of our teen-age patients had the use of a wheel chair, two were able to use braces and crutches,

Data on Twelve Patients with Cervical Cord Transections

Case No.	Sex	Cervical Level	Date of Onset	Cause of Accident	Teen-agers					Results to Date
					Age	Urinary Infection	Bedsore	Contractures	Potential	
1	M	4,5	July, 1957	Diving	15	0	0	0	Fair	Wheel chair, partial self-care, e. g., eating
2	M	5,6	May, 1957	Trampoline	17	0	0	0	Good	Wheel chair, braces/crutches, partial self-care, e. g., eating
3	M	5,6	Jan., 1956	Auto	19	0	0	0	Good	Wheel chair, braces/crutches, partial self-care, e. g., eating
4	M	5,6	June, 1954	Auto	19	+	+	+	Poor	Homebound, bed, wheel chair, partial self-care, e. g., eating
5	M	8-T5	Oct., 1955	Motorecycle	14	0	0	0	Good	Wheel chair, braces/crutches, ambulatory
6	F	5,6	May, 1955	Auto	16	+	+	0	Fair	Wheel chair, partial self-care, e. g., eating
Adults										
7	F	4,5	April, 1957	Auto	25	+	+	+	Negligible	Completely helpless, bed, breathing difficulty
8	M	5,6	Aug., 1957	Auto	19	+	+	+	Poor	Homebound, bed, wheel chair, no self-care
9	M	5,6	June, 1956	Diving	23	+	+	+	Poor	Homebound, bed, wheel chair, no self-care
10	M	6	June, 1957	Fall from window	40	0	0	0	Fair	Wheel chair, braces/crutches, ambulatory
11	M	6,7	Nov., 1956	Auto	63	+	0	0	Fair	Wheel chair, braces/crutches, partial self-care, e. g., eating
12	M	6,7	May, 1957	Auto	14	+	0	0	Fair	Wheel chair, partial self-care, e. g., eating

the anterior division of the first thoracic nerve, injury to this portion of the cord was considered as producing a quadriplegic disability.

The table lists six teen-age quadriplegic patients. Their ages range from 14 to 19 years. Five patients were male and one female. Spinal cord level of injury was as follows: C-4,5, one (17%); C-5,6, four (66%); C-8 to T-5, one (17%). It is interesting to note that the majority of injuries (66%) were at the C-5,6 level and were sustained during the warm weather months. One teen-ager with a level of injury involving a wide section of the spinal cord has been included in the series because of the cervical involvement. However, since the main damage occurred at the T-5 level, his potential capacity for rehabilitation was better than the others. For simplicity, complications have been indicated under three headings: urinary infection, decubitus ulcers, and contractures. Potential, as

and all had some degree of self-care ability. One patient who was injured in 1954 was practically homebound but could manage to spend a few hours in his wheel chair. Our single female teen-ager was obese and failed to cooperate in controlling her diet. Consequently she developed decubitus ulcers which necessitated plastic surgery on two occasions.

A comparable group of adults had also been admitted during this period. The one female patient in this group had a complete transection of the cord which made her helpless below the shoulder level. In view of her respiratory difficulty and the presence of complications her prognosis was considered doubtful. Poor potential in the adults was due primarily to the presence of urinary infection, bedsore, and contractures. Those adults rated fair had relative freedom from complications, were mobile in a wheel chair, and could stand with braces and crutches.

Determining Rehabilitation Potential

After the physical examination certain physical assessments were needed before setting up a rehabilitation goal: (1) motor function—manual muscle test; (2) sensory levels—charting of dermatomes; and (3) performance activities—"daily living" test. These tests served as objective guides to the extent of disability and later on to the progress made during the course of treatment. In order to determine suitability for functional rehabilitation, the following additional medical considerations had to be examined.

Extent of Injury.—Where orthopedically and neurologically indicated, stability had to be restored to the spinal vertebrae by fusion or bracing. The assurance of spinal stability then permitted maximal activity programs.

Condition of Bladder and Intestines.—The level of bladder and bowel function was a basic element in rehabilitation of the patient with spinal cord injury.⁵ Stones in the kidney or bladder had to be removed. In addition, where catheterless (automatic or reflex) bladders could be made to function, potential for rehabilitation was considerably elevated. Other considerations such as leaking catheters, particularly in females, required attention, as these can create much reluctance to cooperate in any training program. Control of bowel function is also of major importance. Unless trained to empty regularly they may become an obstacle preventing recovery.⁶

Decubitus Ulcers.—Presence or absence of bedsores is a most significant factor in developing rehabilitation potential.⁷ Physical medicine therapy becomes severely restricted, particularly when large single or multiple decubitus ulcers necessitate positional nursing care and extensive skin hygiene.

Psychological Attitude.—In cases where the patient did not wish to get well, or failed to cooperate, rehabilitation had to be delayed until motivation was restored. Assistance from the psychiatrist was essential. In evaluation of educational levels and vocational aptitudes, psychometric analysis was needed, particularly if realistic goals were to be established.⁸ Typical management of a case is described in detail below, as well as summaries of two other cases.

Report of Cases

CASE 5.—This 14-year-old male student was admitted to the hospital on Oct. 13, 1955, with a diagnosis of spinal cord injury at the level of C-8 to T-5, with compression fracture at T-5; disability: quadriplegia. He had been injured in a motorcycle accident on Oct. 12, 1955. He was unable to move his lower limbs and had impaired finger function bilaterally. Bladder and bowel control had been lost. Laminectomy was performed at Children's Memorial Hospital soon after admission.

Physical medicine examination revealed a spastic paralysis in the lower limbs and hyperactive reflexes with ankle clonus. There was fairly good muscle strength in both upper

limbs, but impaired function was noted in the fifth fingers of both hands. Some strength was present in the upper abdominal muscles. The patient required an enema every other day for bowel emptying, and an indwelling catheter. Sensation was present to approximately just below the nipple line. No decubitus ulcers were noted. He would require a comprehensive program of physical medicine and rehabilitation. Self-care activities were to be encouraged, including a bowel and bladder control program. During this period it was recommended that a standard wheel chair of the collapsible type be prescribed for him, with hand brakes, 8-in. front wheel casters, heel strap, footrest, sponge rubber seat cushion, and removable arms. Because of the high lesion he would need bilateral long leg braces with pelvic band and perhaps a modified type of spinal support. Our evaluation committee on rehabilitation scheduled him for early consideration by the various disciplines concerned. The evaluation committee's report was as follows:

Physical Therapist.—Treatment was begun on Nov. 28, 1955, consisting of strengthening exercises of the upper limbs with progressive resistance and ranging of joint motions of the lower extremities. By Jan. 13, 1956, he had improved in his wheel chair activities, getting into bed and from bed to the wheel chair, propelling wheel chair, going in and out of doors, starting, stopping, and locking and unlocking brakes. He was also able to get from the chair to the toilet. On Jan. 18, 1956, he started working on the mat, getting from the chair to the mat and back to the chair, doing pushups, rolling, sitting, balance and flexibility exercises, and taking socks off and putting them back on again. At the present time he is capable of taking care of himself from the standpoint of activities of daily living.

Occupational Therapist.—The occupational therapy program consisted of evaluating his inherent self-care activities and giving a functional prescription to improve his muscle strength in the upper limbs. All dressing activities and the use of tools were encouraged.

Psychologist (Psychometric Analysis), Feb. 16, 1956.—A Wechsler-Bellevue (full scale, form 2) yielded the following results: verbal scale I.Q.:88; performance scale I.Q. 95; full scale I.Q.:90. This would place the patient in the average I.Q. range. Test scatter was rather small, indicating an even level of performance with no bright spots and no striking weaknesses. He was somewhat poorer in those tasks which might be characterized as academic or conceptual.

According to the Kuder Preference Record (form C), the patient's highest peak occurred on scale 8, the social service scale, and here he was at about the 98th percentile. Next was the mechanical scale on which he scored at the level of the 85th percentile. His lowest scores occurred on the clerical and artistic scales, on both of which he was at about the 8th percentile. It should be emphasized that at this age one would not necessarily expect a full crystallization of interest and interest patterns. Certainly it ought to be recommended that his Kuder record be considered in the light of this fact; further testing is indicated on subsequent occasions when vocational choices must be made more definitively.

On the Minnesota Multiphasic Personality Inventory (MMPI), all scale scores were within the normal range and indeed no single scale elevation went beyond a standard deviation. One of the interesting things about this was that it seemed to reflect so little the psychological repercussions of the state of affairs brought about by the accident. One would ordinarily expect in so drastic an accident something more in the way of a depressive affect; however, none was manifested at this time.

Social history indicated that he was one of six children and had always attended school regularly. He had a normal interest in school and in sports. In addition he worked on a paper route. Although the patient had given some thought to his future, he did not know what he wanted to do. The

patient was extremely anxious to visit his brothers and sisters. After a visit home for a week-end his anxiety was relieved and he was able to settle down to his treatment.

Vocational Counselor.—The State Vocational Rehabilitation Division was anxious to cooperate in this youngster's vocational rehabilitation. However, it was felt that he should continue his education. When this has been satisfactorily completed, he will become a good prospect for rehabilitation and the vocational rehabilitation agency will be happy to accept him as a client. The Okmulgee Rehabilitation Center will also assist in this vocational training so that he can be prepared for remunerative employment.

Potential to June 1, 1958.—Follow-up on this patient has revealed ambulatory ability with braces and crutches and complete independence in self-care and toilet. He plans to

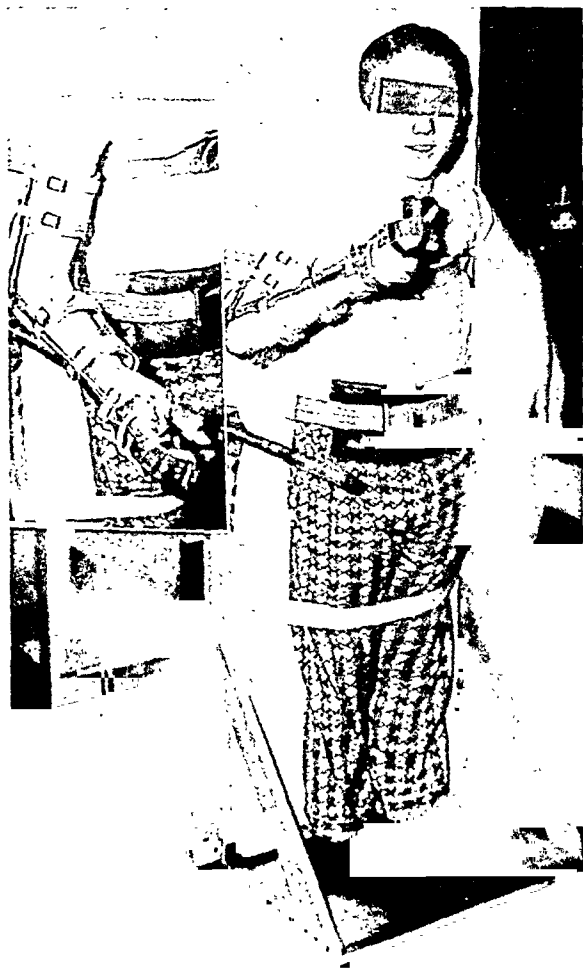


Fig. 1 (case 1).—Quadriplegic patient with involvement at C-4,5 standing with aid of tilt-table. Close-up, view of functional arm assistive aid.

graduate from high school and then enter the Okmulgee Rehabilitation Center for vocational training. He is interested in radio repair work and is being encouraged in this direction. What his ultimate potential may be cannot be predicted. However, as with all disabled persons, capabilities have to be tried in actual situations, and for an indefinite period, for valid conclusions to be drawn.

CASE 1.—This 15-year-old male student was admitted on June 7, 1957, with fracture dislocation at C-4,5 and spinal cord injury; disability: quadriplegia. On June 7, 1957, the

patient had dived into a country club swimming pool and had to be pulled out. Apparently he had struck the bottom of the pool. He was completely paralyzed from the neck down. X-ray revealed a fracture of C-4,5 with forward dislocation of C-4. Sensory loss was to just above the nipple line. There was some use of the biceps muscles from the motor aspect. The Queckenstedt test showed no block of spinal fluid, but the fluid was bloody. Fifteen pounds of cervical traction was applied by means of Crutchfield tongs. During this period the patient developed signs of cyanosis. He was operated on on June 11, 1957, because of deterioration in his general condition. Before the dura was opened, considerable tissue degeneration and the presence of extradural fat was noted. The cord appeared ecchymotic and edematous with a spindle-shaped swelling at the level of C-4,5. Complete fractures at the bases of the laminae were seen, but without wide separation. A decompression was then performed and the dura left open to relieve pressure. A bone graft, taken from the right tibia, was inserted as an "H-block" between C-3 and C-6 with wire about the spinous processes.

Tongs traction was removed on July 28, 1957, and he was transferred to Children's Memorial Hospital on Aug. 5, 1957, for physical medicine and rehabilitation. After approximately one year of intensive comprehensive therapy, the following capacity had been developed.

Potential to June 1, 1958.—The patient can spend a full day in his wheel chair, to receive physical or occupational therapy, to engage in diverse recreational pursuits, or to receive schooling from his teacher (fig. 1). On the week-ends he is able to go out for automobile rides with his parents. An indwelling catheter as well as a leg urinal is required, since an automatic bladder has not been developed as yet. Bowels are controlled by an enema every other day. A practical nurse is needed daily for skin hygiene and toilet. He is able to feed himself with a right upper extremity brace and functional aids. He can roll a wheel chair at least 25 yd. unassisted, but cannot lock its brakes. He types with an electric typewriter. His studies have been maintained with the help of a teacher assigned by the state board of education. Our plans are to allow him to graduate from high school along with his regular schoolmates. Social, psychological, and vocational assessments have been made with follow-up interviews.

Laboratory tests gave the following results: Urinalysis revealed presence of *Proteus vulgaris*; creatinine level was 1.08 Gm. per 24 hours; creatine level, 0.371 Gm. per 24 hours; 17-ketosteroid level, 7.8 mg. per 24 hours (Klendshoj method) (normal for men: 8-17; for women: 6-14); 17-ketosteroids (mg.) divided by creatinine (mg.) = 7.22 (normal = 10). (Testosterone propionate in oil (100 mg.) had been injected intramuscularly every five days since Aug. 6, 1957.) The white blood cell count was 9,900 per cubic millimeter, with 66% mononuclear leukocytes, 33% lymphocytes, and 17% eosinophils; hemoglobin level was 15.0 Gm.; calcium level, 10.2 mg. per 100 cc.; phosphorus level, 5.2 mg. per 100 cc.; and creatinine level, 0.89 mg. per 100 cc. There was no evidence of calculi in the urinary tract or bladder.

CASE 2.—This 17-year-old male student was admitted on May 9, 1957, with dislocation at C-5,6 and spinal cord injury; disability: quadriplegia. The patient was admitted to St. Anthony's Hospital after an accident on the trampoline. His neck became acutely flexed, but consciousness was not lost. He developed an almost immediate loss of feeling and motor power in all four limbs. His weight was 175 lb. (79.4 kg.). After the injury, sensation was present to just below the clavicle anteriorly and somewhat higher posteriorly. X-rays revealed a complete dislocation of C-5,6 without fracture. Crutchfield tongs were applied to the skull and 12 lb. of traction used after reduction. He was operated on on June 18, 1957. The interspinous ligament was found to

be severely disrupted, but no fracture was evident. Heavy stainless steel wire was run through a small hole in the process of C-6 and a graft from the tibia was applied bilaterally to the two vertebrae. The Crutchfield tongs were removed July 19, 1957, and a neck brace was applied to permit the patient to sit up. Transfer to Children's Memorial Hospital was made on Aug. 5, 1957, for physical medicine and rehabilitation.

Potential to June 1, 1958.—The patient is able to propel the wheel chair unaided except for curbs and ramps. When placed in braces, he is ambulant for short distances. Braces have been prescribed primarily for their physiological and psychological effects (fig. 2). He can feed himself but requires toilet attendant care. With some assistance he can move to a wheel chair from the bed and back again. Assistive aids make communication activities possible. He plans to attend Oklahoma University full time with a companion student and is interested in studying law and accountancy.

Pertinent laboratory data include the following findings: *Proteus vulgaris* organisms were present in the urine; creatinine level was 1.07 Gm. per 24 hours; creatinine level, 0.09 Gm. per 24 hours; 17-ketosteroid level, 9.2 Gm. per 24 hours (Klendshoj method) (normal—men: 8-17; women: 6-14); 17-ketosteroids (mg.) over creatinine (mg.)=8.60 (normal=10). (Testosterone propionate in oil (100 mg.) had been injected intramuscularly every five days since Aug. 6, 1957.) Blood cell count and chemistry tests yielded the following results: white blood cell count, 8,500 per cubic millimeter, with 55% mononuclear leukocytes, 37% lymphocytes, and 8% eosinophils; hemoglobin level was 16.6 Gm.; calcium level, 10.5 mg. per 100 cc.; phosphorus level, 4.9 mg. per 100 cc.; and creatinine level, 1.3 mg. per 100 cc. There was no evidence of calculi in the urinary tract or bladder.

As seen from our typical findings, the metabolism of these youths conformed to fairly normal limits; the excretion levels of creatine and creatinine were satisfactory, the urinary 17-ketosteroids mirrored adequate testicular and adrenal cortical hormones, and the calcium and phosphorus blood levels were excellent evidence of our intensive mobilization program. Other than the continued presence of *Proteus vulgaris* in the urine, genitourinary infection was no particular problem.

Comment

When spinal cord involvements affect the upper elements of the brachial plexus and diaphragmatic innervation, basic musculature for survival and self-care is lost, and any potential for rehabilitation becomes negligible. A patient's only hope is for domiciliary nursing care. Consequently, in making a prognosis for a quadriplegic patient the level of spinal cord interruption is all-important.⁹ The second consideration relates to early expeditious comprehensive therapy. Most authorities appear to agree on this aspect of management.¹⁰ The third important factor is a patient's age. The very young lack insight and cooperate uncertainly. The adult and aged usually have ingrained modifying psychological traits which are unpredictable.¹¹ The teen-aged group offers rich soil for rehabilitation measures.

The impact of prolonged hospitalization on the teen-ager living in a therapeutic environment with nursing personnel and physical and occupational

therapists creates dynamic factors which can bring to bear long-lasting motivating corrective influences. On the whole, the anxiety and guilt feelings of the parents do not appear to disturb these adolescents greatly. When a rational program of rehabilitation is explained and initiated, teen-agers respond com-

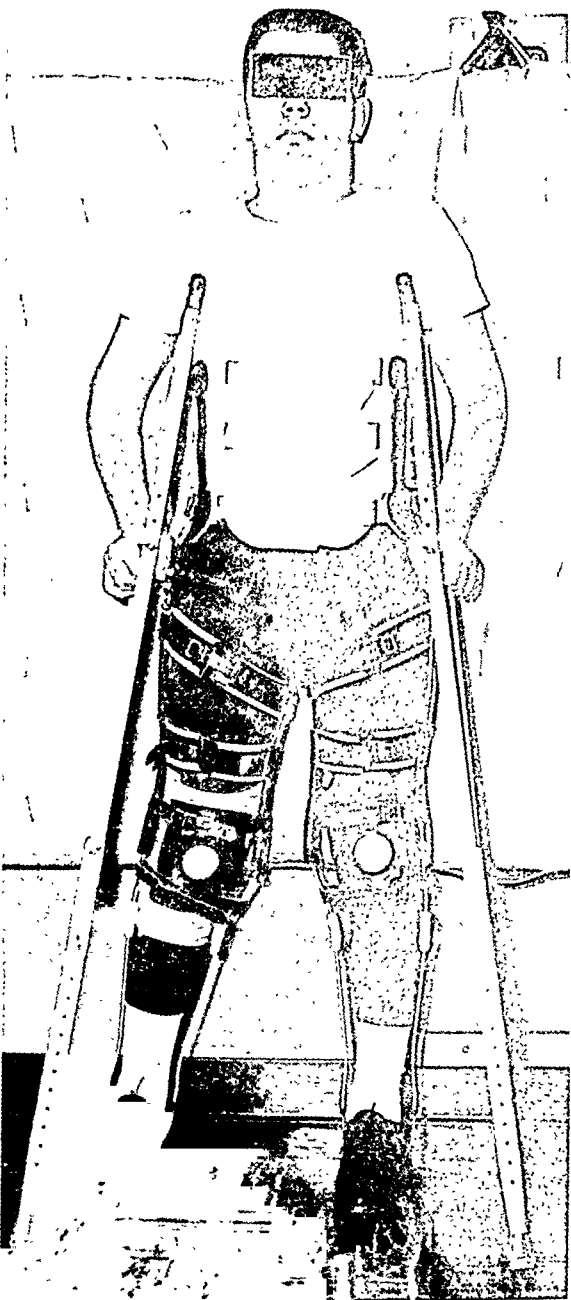


Fig. 2 (case 2).—Quadriplegic patient with involvement at C-5,6 standing with braces and crutches.

paratively well to improving themselves. They integrate data from all sources and the emotional attitudes which are derived come chiefly from the staff. Attachments, if any, are mainly directed to the institution and its personnel.

Psychology of the Teen-ager.—The era comprising the teens is generally a period of problems normally. Along with growth and development the years of puberty are complicated by new emotions, new desires, and new-found freedoms. Emergence from immaturity to maturity may provoke a whole series of conflicts. This graduation from dependence to independence is a natural fulfillment of individual endeavors. The teen-ager unfortunate enough to have a high spinal cord trauma and severance is, therefore, in a most disadvantageous position. Because of the remoteness from parental influences, relationships with the opposite sex may be disrupted. It has been said that spinal cord injury can create all types of psychic activity, on both the conscious and unconscious levels.¹² Thus far, it has been our experience, surprisingly enough, that the physical impairment has a mitigating effect on the personality.

During a teen-ager's early formative years his personality development depends to a large extent on experiences within the family. Parents may have preconceived attitudes toward disabled people which are reflected in their children's views. However, in general, the age when disability occurs, particularly in quadriplegia, shapes the nature of attitudes concerning the future. A normal adolescent is imaginative but rarely understanding regarding situations and emotional problems. Most of us have an escape from any hurt in this developmental phase of life through other interests, but the quadriplegic teen-ager does not. He enters a period of social conflicts with insufficient outlets. Physical manifestations of bodily dysfunction also become hidden.

It is said that body image is generally incorporated into our psychic make-up at an early age. It is only later, when the perception of the external body becomes pronounced as at the prepuberal or puberal levels, that teen-agers become moved by the profound psychic forces within them. Since the integration of a physical disability takes considerable time to become formulated into a body image, the adolescent usually does not have time to become depressed. In a program of intensive physical restoration the body image is relegated to the background and attention is directed to rehabilitation activities. Only when recreational or vocational pursuits are encountered does the significance of certain bodily functions become psychologically important for these patients. How these areas and functions become important may be guided by the early experiences in rehabilitation training as well as by basic psychological needs. Misdirected efforts and poor physical medicine programming may create psychological upsets which can be overwhelming even to a normal individual. Body image disruption also may become pronounced through the development of decubitus ulcers, urinary infection, and other complications.

In adults, the total personality adjustment is shaped more directly to the personal psychological view of the paralysis.¹³ Adults, too, may or may not be objective in viewing their paralysis. While, on the one hand, some will relate the destruction of the body to a punishment from above, others will accept the inevitability of the situation and strive to adjust to their disability. The teen-ager apparently does so with relative ease.

Potential Functional Goals.—With appropriate therapy, many activities are within the range of the quadriplegic patient. With involvement at the C-4,5 level, feeding, page-turning, sanding, type-writing (electric), brushing teeth, and propelling a wheel chair are possible with assistive aids. Nose-scratching and sitting in wheel chair require no aids. With involvement at the C-5,6 level, use of electric razor, smoking, use of zipper, writing, turning over in bed, transferring to and from bed to wheel chair with horizontal bar, and use of ordinary typewriter are possible with assistive aids, and the patient can stand in braces with crutches unaided. With involvement at the C-6,7 level, the patient needs no aids to use fingers and wrists, crutches, telephone, tools, and office machines and can partially dress himself. With involvement at the C-8 to T-1 level, the patient has full use of wheel chair, full upper limb functioning, and can perform the following activities unaided: dressing, undressing, radio repair, and carpentry. The patient is ambulatory (with braces and crutches), and can drive a car.

Our studies have indicated that if use is made of every available residual function, particularly in the younger patient, certain self-care and wheel chair activities become possible. For example, our patients were able to sit in a wheel chair and by means of special knobs and studs attached to the hand rims could achieve a degree of self-care mobility. One of the youths with involvement at the C-5,6 level was able to stand unaided with bilateral long leg braces, modified Knight spinal type of attachment, and the use of crutches. Needless to say, braces are prescribed primarily to achieve the physiological benefits of standing and not for any major degree of ambulation. It is felt that these persons cannot, with safety, be permitted to walk unaided and, therefore, the security of a wheel chair is needed at all times.

Urinary Infection.—In our studies, urinary infection was the most common complication, as was to be expected. However, after the first few flare-ups and until bladder routine could be learned, the management program appeared to control this problem rather well, particularly with the teen-age group. It was found that infection usually developed as a result of carelessness or not conforming to instructions. In one case, a Foley catheter was inflated within the urethra and produced a

periurethral abscess. Apparently frequent changing of the catheter did not provoke as many infections when strict asepsis was maintained. Foley catheters were used routinely and tidal drainage was very helpful in managing our teen-age patients. The soluble sulfonamides and other antibiotics were able to control these urinary infections; however, no attempt was made to keep the urine sterile. As indicated in the laboratory data, *Proteus vulgaris* was found frequently. The other typical findings reflected the health of these youths. Unfortunately, most of these tests were not performed in the adults. We were fortunate that on only two occasions during the 12 months were our teen-agers absent from the physical medicine department because of elevated temperature. Contrary to what was expected, our female teen-ager had more difficulty than the males with bladder infection. In her case it was believed that this was due to the injury being sustained several years prior to the establishment of adequate treatment. She also required removal of several calculi from the bladder in addition to plastic repair for bedsores.

Decubitus Ulcers.—Decubitus ulcers are preventable in most quadriplegic patients if good nursing care is available.⁷ Our adult patients developed bedsores because they were treated without a Stryker frame and with insufficient attention being paid to the skin. We found the Stryker frame to be the most efficient nursing aid during early rehabilitation for teen-agers. Not only does it permit easier nursing and transportation by a single nurse but it also makes it possible for the youth to attend movies and other recreational pursuits with facility.

In the early phases of nursing management, each patient was turned day and night every two hours. This is mandatory. Later, a prone position was encouraged for reading and study purposes. However, as strength in the back muscles became pronounced, a wheel chair was used more frequently during the waking hours. In order to maintain the condition of the skin, patients were impressed with the fact that frequent movement of a rocking nature was necessary in order to prevent isolated pressure points on the skin. If this was impossible, assistance by a nurse or attendant or with a hydraulic lift became necessary.

After six months we found that the nutrition of the skin was well maintained particularly when the protein and vitamin intake were kept at a high level. It was noticed that the skin turgor and circulation did not appear grossly different than that observed in normal skins when the above routine was followed. Muscle atrophy, seen in many paraplegics, also was not as evident under these circumstances, which is an interesting observation for further investigation. There appeared to be a tendency for teen-agers to put on weight; conse-

quently, the weights were recorded repeatedly. Excessive perspiration was present, particularly during the early months, but later appeared to become more normal.

Contractures.—Active and passive therapeutic exercises embodying all the principles of basic physical medicine will minimize the development of contractures. Assistive aids, such as a functioning footboard and braces, contribute greatly to such prevention. Since muscle imbalance resulting from the paralysis is the underlying cause of muscle shortening, retraining measures employed in rehabilitation have been found to be most satisfactory. No contractures were noted in any of our teen-agers except for our homebound patient. Half of our adults manifested impaired joint ranges not only in the lower limbs but also in shoulder, elbow, wrist, and finger joints. These became limiting factors in the development of rehabilitation potential.

Mental Attitude.—It has been said that paraplegic patients, in the teens and twenties usually become depressed during the third and fourth week after injury. We have not found this to be true in our teen-age group. Perhaps this is due to the fact that an adolescent is still in the process of development. The few functioning muscles such teen-agers possess can be developed through prescribed exercises. Since our aim is to approximate the individual to a way of life as nearly normal as possible, we believe that even assistance in the adaptation to a "wheel chair life" is worthwhile; such youths can become dexterous in the use not only of the wheel chair but also of other assistive devices. As soon as feasible, psychomotor orientation should be given to shift the thinking from the paralyzed to the normal parts of the body.

Muscle Rehabilitation.—The important muscle innervations by spinal cord levels are as follows: at the C-2,3 level, the sternocleidomastoid, trapezius, neck extensor, and part of the erector spinae muscles; at the C-3,4 level, the diaphragm and trapezius muscles; at C-4,5 level, the rhomboid, diaphragm, supraspinatus, infraspinatus, and portions of the subscapularis, deltoid, teres, biceps, pectoralis, and serratus muscles; at the C-5,6 level, the subscapularis, deltoid, biceps, teres, serratus, brachioradialis, supinator, extensor communis digitorum, pronator teres, flexor carpi radialis, and portions of the latissimus dorsi, triceps, extensor carpi radialis, opponens pollicis, abductor and flexor pollicis muscles; at the C-6,7 level, the latissimus dorsi, triceps, carpi extensor, opponens, and portions of the carpi flexor and lumbricales (lateral) muscles; at the C-7,8 level, the carpi flexor, interossei, and pectoralis muscles; and at the C-8 to T-1 level, the carpi flexor, lumbricales (medial), and part of the erector spinae muscles.

Particularly in the spinal cord lesions above T-1, re-education of these muscles should be stressed. With exercise the trunk muscles, especially the latissimus dorsi, depressors, and elevators of the shoulder, the scapulae stabilizers, can be enhanced and marked functional capabilities developed. The latissimus dorsi, which is supplied from as high as C-6 to C-8, is bypassed by most C-8 to T-1 lesions and can serve as the medium for connecting the paralyzed portion of the body to that which is normal. Another powerful back muscle which maintains the patient in an erect position is the erector spinae, supplied from C-1 to C-3. Lesions below T-1 permit a patient to sit and stand erect by using muscles above this level. The triceps muscles are innervated from C-6 to T-1 and are essential for walking on crutches. Those with injuries of the spinal cord find this muscle most useful when developing rehabilitation potential. The rectus and oblique abdominis muscles are supplied from T-5 to T-12 segments, and when their functions are lost a corset support is often required.

In the compensative retraining of muscles, an intensive program of graduated progressive resistive exercises for the upper extremities is prescribed. Systematic training of these muscles will result in increased power and will enable the youth to maintain the upright position first in sitting and then perhaps in standing. Since postural sensibility is also impaired, balance becomes precarious. Only through training can the visual and postural senses be enhanced to the point of security.

Self-care and Assistive Aids.—Since a quadriplegic teen-ager has to be prepared for the future and for personal responsibilities, he must be taught to eat and drink and to dress himself if at all possible. Also it would be advantageous for him to be able to hoist himself onto the bed or into the wheel chair, with or without assistive devices. He must also assume the responsibility of caring for his skin, as prolonged pressure while in the wheel chair can lead to bedsores. He should acquire the habit of changing positions at regular intervals. He must avoid accidents such as burns or injuries to his paralyzed extremities and substitute with his eyes for sensation loss. It is not intended that a quadriplegic walk for any distance, but development of ambulatory ability can provide him with a means of getting to and from the toilet and meeting similar situations. Above all, he must become reliant on his own capabilities wherever feasible.

Summary

With an increasing accident rate, spinal cord injuries are becoming more prevalent. These severe disabilities are now being seen in the teen-age group and at higher cord levels. Potential for reha-

bilitation is better in teen-agers than in adults. For achieving success, prompt comprehensive physical medicine and rehabilitation effort is necessary. Utilization of the modern techniques of rehabilitation, with meticulous attention to the skin and to the urinary and neuromuscular systems, makes a useful social and economic life feasible. It is possible not only to "break one's neck" today but to live with it moderately well.

Dr. Don H. O'Donoghue, Chairman, Department of Orthopedic and Fracture Surgery, gave permission to publish the case reports summarized in this study.

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PRACTICAL MANAGEMENT OF ERYTHROBLASTOSIS FETALIS IN A COMMUNITY HOSPITAL

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Since the introduction, in 1946, of exchange transfusion therapy for infants with erythroblastosis fetalis (hemolytic disease of the newborn infant), with the resultant improvement in methods of diagnosis and prognosis of this disease, a wealth of knowledge and literature has been accumulated. The early literature consisted of descriptions of the techniques of, indications for, and results of exchange transfusion. As the procedure became more standardized and its use more widespread among pediatric centers, it became increasingly evident that a number of factors are involved in the interpretation of the severity of this disease and the resultant proper management of these infants.

As early as 1949, Mollison and Cutbush¹ pointed out that babies with erythroblastosis have subnormal cord hemoglobin levels; that the majority of affected babies have cord bilirubin levels above 3 mg.%, as compared to those of unaffected babies, which range from 0.8 to 2.6 mg.%; and that the degree of anemia and hyperbilirubinemia can be related to the ultimate prognosis of the baby. Two years later, following the observation of Allen, Diamond, and Vaughan² that there is a relationship between severity of clinical jaundice, serum bilirubin levels, and kernicterus and that multiple exchange transfusions might be of benefit in controlling jaundice, Mollison and Cutbush³ suggested that replacement transfusions should be "given to every infant whose bilirubin would, without treatment, exceed a safe level, perhaps 18 mg. per 100 cc."

In 1952, Hsia and co-workers⁴ pointed out that there is a lag between the rise of serum bilirubin level and the development of clinical jaundice, thus clarifying the value of bilirubin levels in the earlier diagnosis of erythroblastosis, and, even more significantly, showed that there is a definite correlation between the serum bilirubin level and the occurrence of kernicterus. A serum indirect bilirubin level of 20 mg.% was thus established and almost universally accepted as the "critical maximum level" to avoid kernicterus. It was demonstrated that the bilirubin level can be markedly lowered by the removal of 85% of the affected baby's circulating blood and replacement of the infant's blood with 2 volumes (70 to 80 cc. per pound) of donor blood.

Erythroblastosis occurred in 111 of 14,908 live births on which this study was based. The goal of treatment was to avoid kernicterus by keeping the serum indirect bilirubin level from rising above 20 mg. per 100 cc. The bilirubin value was found to be more reliable than the hemoglobin value as an indicator of the severity of the hemolytic process. The most important part of treatment is the exchange transfusion, and it is necessary for all concerned to cooperate with the transfusion team. In the most severe cases, with hydrops fetalis, profound anemia, and cardiac failure, the only hope lies in immediate exchange transfusion followed by a second transfusion within three or four hours. Because treatment must be prompt, the authors believe that it should be given in the local hospital, provided laboratory facilities are adequate. In this series there were six deaths, of which five were in infants with Rh and one in an infant with ABO incompatibility.

With these criteria established and kernicterus, theoretically at least, preventable, efforts were directed toward earlier diagnosis and treatment to avoid hyperbilirubinemia of this degree. Even as early as 1950, Vaughan and co-workers⁵ discussed the role of earlier referral and admission of erythroblastotic babies to the hospital in improving the over-all prognosis of this disease, and this earlier admission was felt to be due largely to greater awareness on the part of local obstetricians and pediatricians of the sensitization of mothers. Feldman and associates,⁶ in 1954, explained their low mortality as due to their good fortune in being able to treat the infants within the first 8 to 24 hours after birth. As late as May, 1957, Wheeler and Ambuel⁷ published their "set of instructions" sent to obstetricians for the management of these babies prior to their transfer to a "treatment center."

It has been mentioned repeatedly that all babies with hemolytic disease of the newborn except those with very mild disease and those who are moribund should receive replacement therapy. Until recently there has been very little evidence in the literature that babies with hydrops fetalis, pro-

From Providence Lying-In Hospital.
Read before the Section on Pediatrics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

found anemia, and cardiac failure are considered salvable. It would seem that the utmost efforts now should be directed toward improvement in the care and treatment of the severely sensitized baby.

Now that the method of treatment has been well standardized and that determination of the indirect bilirubin level has been established as the criterion for the prevention of kernicterus, it is our opinion that babies with erythroblastosis fetalis can and should be managed in the local hospitals where they are born, provided adequate laboratory facilities are available. The only hope in the difficult problem of treatment of a baby with hydrops, at this time, seems to lie in immediate exchange transfusion, followed by a second transfusion within three to four hours, without consuming time in his transfer to other hospitals. It is the purpose of this paper to summarize the experience with erythroblastosis in a community hospital.

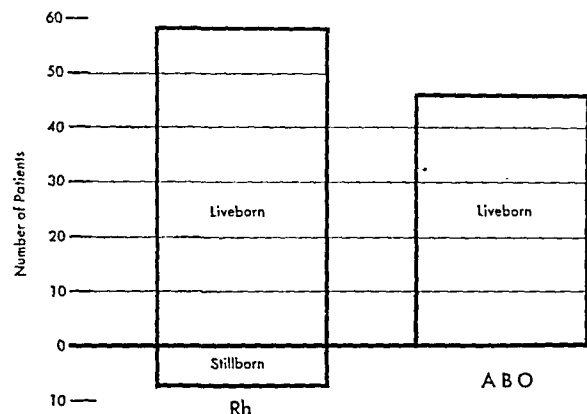


Fig. 1.—Comparison of number of patients with Rh and ABO incompatibility among 111 cases of erythroblastosis.

Material

All of the infants were cared for at the Providence (R. I.) Lying-In Hospital during the period from October, 1954, through September, 1956. The group included both clinic and private patients. During this two-year period of study there were 14,908 live births. There were 111 babies with erythroblastosis, 7 of whom were stillborn. There was, therefore, an incidence of 7.0 living erythroblastotic babies per 1,000 live births. Of these 104 living patients, 58 (55.8%) had erythroblastosis due to Rh incompatibility and 46 (44.2%) had erythroblastosis due to ABO incompatibility (fig. 1). The handling with regard to exchange transfusions and prevention of kernicterus was essentially the same for babies with disease due to ABO incompatibility as for those with disease due to Rh incompatibility. The proportion of ABO to Rh incompatibility has steadily risen at this hospital over the past few years, to the present level of 44.2%. The latest paper of Allen and Diamond⁸ reveals that two-thirds of their cases of erythroblastosis fetalis are due to ABO incompatibility.

Methods

All babies, whether clinic or private, with the suspected diagnosis of erythroblastosis, were seen, given transfusion if necessary, and given follow-up examinations by one or more of the five members of the "exchange transfusion team," a group of practicing pediatricians organized in 1952 (along with the pediatric resident or the attending pediatrician).

All mothers, except those admitted in labor as emergency patients without prenatal care, had venous blood drawn for blood group and Rh factor determination early in pregnancy. Notation of the mother's type and Rh was routinely put on all the babies' charts in the delivery room. "Routine blood work," consisting of determinations of blood group, Rh factor, hemoglobin level, and Coombs' test result, was performed, immediately on delivery, on all babies of the "emergency" group. Blood was drawn during pregnancy for anti-Rh titer, as soon as mothers were found to be Rh negative; again early in the last trimester; and usually within 10 days of the anticipated time of delivery. In most cases, blood was drawn from the fathers in order to determine their genotypes.

Whenever possible, the obstetrician alerted the pediatrician of any mother whose anti-Rh titer rose during the last trimester or who had previously delivered sensitized infants. The pediatrician in turn reported these findings to a member of the exchange transfusion team. When this mother went into active labor, the laboratory, the blood bank, the delivery room, the attending pediatrician, a member of the exchange team, and the pediatric resident were notified and all arrangements were made for immediate transfusion if indicated. This coordinated teamwork is the most important requirement for good management of these infants (fig. 2).

An attempt was made to evaluate the total situation in each case. Almost invariably, very ill babies (with clinical hydrops fetalis, marked anemia, or cardiac failure) were given transfusions before leaving the delivery unit. Although cord blood usually was studied for blood group, Rh factor, direct Coombs' test, and bilirubin levels, transfusions were started in most of the babies with hydrops before results of the laboratory tests (requiring one hour) were reported.

Babies whose condition did not warrant immediate therapy were transferred to the nursery. Their cords were kept moist with isotonic sodium chloride solution; they were given nothing by mouth; and their bilirubin and hemoglobin levels were determined at 6-hour to 12-hour intervals. Decision as to management of these babies was based largely on bilirubin levels. All babies whose indirect bilirubin level rose to 20 mg.% were given transfusions, but, since early replacement therapy to remove sensitized red blood cells is felt to be more efficient than removal of serum bilirubin,⁹

every attempt was made to administer transfusions long before the level of 20 mg.% was reached. Babies whose indirect bilirubin level reached 7 mg.% by the age of 12 hours were usually given transfusions. Greatest emphasis, in attempting to judge the future course of these infants, was placed on the rate of rise of indirect bilirubin level. A rise greater than 0.5 mg.% per hour at any six-hour interval during the first 48 hours constituted an indication for transfusion. These figures apply of course to full-term infants. Because premature infants will develop the ability to excrete bilirubin later than will full-term babies, these infants were given transfusions when lower bilirubin levels were present.

In addition to the above methods of case finding on the basis of prenatal anti-Rh titers, all babies of Rh-negative mothers, on admission to the nursery, had the previously defined routine blood work performed immediately. This served to detect the occasional erythroblastic baby whose mother developed no anti-Rh titer or who delivered before the last blood for titer was drawn. It is also, of course, valuable to know the Rh factor of the unaffected infant in terms of the possibility of sensitization in future pregnancies.

All babies with clinical jaundice in the first 36 hours of life or with excessive jaundice at any time during the neonatal hospitalization had routine blood work and determination of bilirubin levels done. The early detection of hemolytic anemia due to ABO incompatibility was frequently due to the alertness of the nursery nurse or the attending pediatrician to presence of jaundice. The indication for exchange transfusion in babies with ABO incompatibility was based on the same desirability of keeping the serum indirect bilirubin level below 20 mg.%. In these babies, too, the increment of more than 0.5 mg.% per hour was found to be a useful index.

Exchange transfusions were done through the umbilical vein. It has been our impression that there is no advantage in leaving the cord long. We have recently used polyvinyl premature feeding tubes. Because of the length of these tubes, it was found useful to clamp them and to insert a 16-gauge needle through the side of the tube, just below this clamp, in order to shorten the "dead space." Type O, Rh-negative blood neutralized with 10 cc. of blood group specific substances A and B (Witebsky substance) was used in all cases. Every attempt was made to use blood which had been stored for less than three days, in order to lessen hyperkalemia and the possibility of hypocalcemia.¹⁰ The blood bank was most efficient in keeping fresh blood available and labeled "hold for exchange transfusion." Whenever time permitted, the blood was warmed in order to avoid chilling the baby, which, in our early experience, was found to be a major source of difficulty, and also to reduce the tendency toward hyperkalemia.¹¹

Venous pressure readings were obtained at the outset of the procedure and at frequent intervals during the course of the transfusion. In babies in good condition, whose exchange transfusion was being done largely for the purpose of removal of sensitized red blood cells and of bilirubin, it was our policy to create a deficit only if there was evidence of significant increase in the venous pressure (up to 90 to 100 mm. H₂O), and, wherever possible, this deficit was corrected toward the end of the procedure. The transfusion was carried out in 20-cc. aliquots, except in babies with evidence of cardiac failure, to a total of 60 to 80 cc. per pound. One cubic centimeter of a 10% solution of calcium gluconate was given intravenously after every 100 cc. of exchanged blood. All babies were given oxygen by mask during the transfusion, were kept warm on a well-covered heating pad

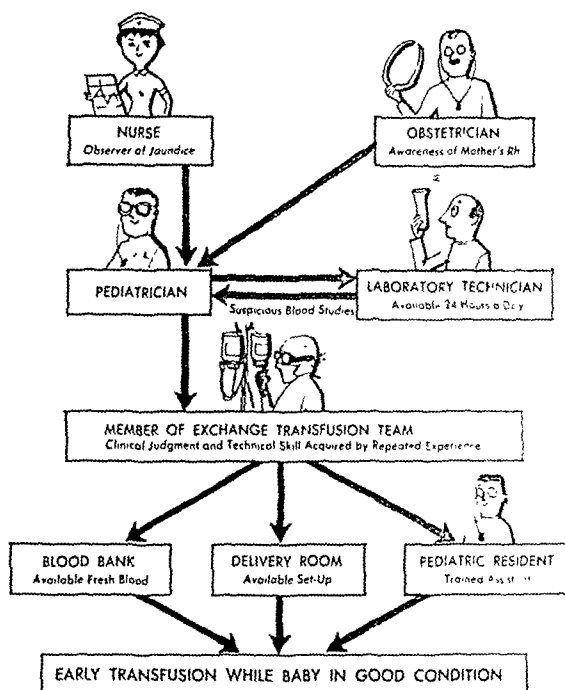


Fig. 2.—Teamwork in management of infants with erythroblastosis.

on "low" heat, and were suctioned as necessary. The transfusion took place over a period of approximately one hour.

In babies with severe erythroblastosis, if in cardiac failure, it was occasionally necessary to create a deficit of 40 to 50 cc. before undertaking the transfusion. Digitalization was started whenever there was evidence of failure. Clinically very ill babies were started on therapy with cortisone (in doses of 10 to 20 mg. a day) and antibiotics, both given intramuscularly, immediately after birth. These babies were sometimes given transfusions with 10-cc. aliquots in order to lessen the rapid changes in circulatory load.

After the transfusion, all babies were sent to the premature nursery and given heat and oxygen therapy, calcium gluconate (but nothing else) by

mouth, and prophylactic antibiotics, avoiding sulfisoxazole (Gantrisin) because of its tendency to increase hyperbilirubinemia.¹² If cortisone or digoxin therapy had been started, it was continued in appropriate doses. Contrary to the opinions

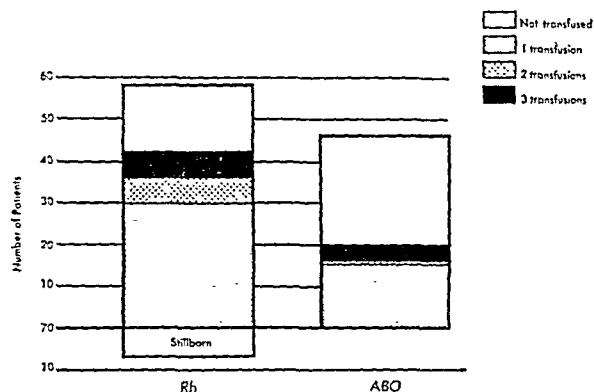


Fig. 3.—Comparison of incidence of exchange transfusions in Rh and ABO incompatibility.

expressed in the literature, it was our feeling that maintaining the catheter in situ by means of a purse-string suture was advantageous, and, with our technique, this procedure did not result in infection. Despite heparinization of the catheter, it frequently was found to contain clots. If it was necessary to replace it, at the time of the second transfusion, insertion of a new catheter was extremely simple in a nicely maintained patent vein, as contrasted to previous mechanical difficulties with dried up vein ends in a drying cord. As soon as the serum bilirubin level began to stabilize or fall, the catheter was removed. Rarely did one remain in for more than 36 hours.

The hemoglobin and bilirubin levels were determined within 6 to 12 hours after the first replacement transfusion and thereafter at 6-hour to 12-hour intervals until the bilirubin level was stabilized below 20 mg.% or until it failed to rise at a significant rate. Babies with rising direct bilirubin levels were given cortisone in an attempt to evaluate its function in the inspissated bile syndrome.

Small transfusions during the usual 10-day hospital stay, or the ensuing six-week convalescent period at home, were given only if the infant had sufficient anemia to produce symptoms, i. e., lethargy, poor appetite, and failure to gain weight, or in the face of late bone marrow recovery as evidenced by failure to maintain the hemoglobin level. Transfusions were rarely given for hemoglobin levels above 7 Gm.%.

Results

Necessity for Exchange Transfusion Therapy.—Sixty-one of the 104 live-born babies on whom the diagnosis of erythroblastosis fetalis was made required exchange transfusion. Seventy-three per cent of the babies with Rh incompatibility were given transfusions. Forty-two of these 58 infants

required 61 exchange transfusions. Of these babies, 29 received only one transfusion, 7 received only two transfusions, and 6 received three transfusions. Forty-one per cent of the babies with ABO incompatibility were given transfusions. Nineteen of the 46 infants required 26 transfusions. Of these babies, 15 received only one transfusion, 1 received only two transfusions, and 3 received three transfusions.

It can be readily seen from figure 3 that, despite the fact that the incidence of ABO incompatibility is increasing because of increasing awareness of its possibility, Rh incompatibility remains, in general, a more serious disease, requiring more vigorous treatment. Nevertheless, ABO incompatibility may produce bilirubinemia with dangerous levels, and such infants should be watched carefully.

Age at Time of Earliest Transfusion.—The earlier diagnosis and necessity for earlier treatment of the babies with Rh incompatibility, as compared to those with ABO incompatibility, is illustrated by figure 4. The initial exchange transfusion in 15 (36%) of the babies with Rh incompatibility was done within four hours of birth, and in 39 (93%) of these patients the initial transfusion was done within 24 hours of birth. Of the three babies receiving their earliest therapy later than 24 hours of age, one had an indirect bilirubin level of 16 mg.% at 48 hours but showed a sudden rise to 23 mg.% at 80 hours, accompanied by a drop in hemoglobin level, and so was given transfusion at 80 hours of age; one was given a transfusion at 72 hours of age, after a slow rise in indirect bilirubin level to 19.7 mg.%; and one was given a transfusion at the age of 36 hours. This baby's bilirubin level was 10.5 mg.% at 12 hours, 16 mg.% at 24 hours, and 20 mg.% at the age of 36 hours.

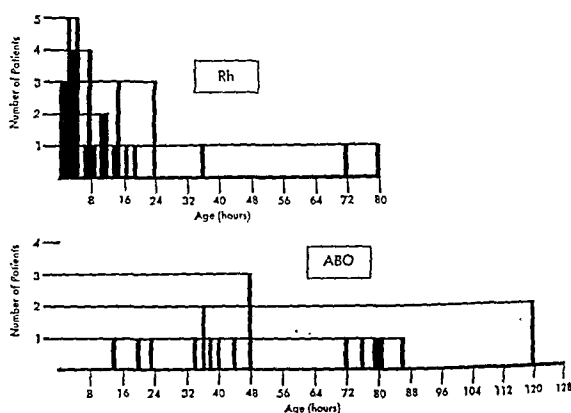


Fig. 4.—Age at time of first exchange transfusion.

On the other hand, the initial transfusion in 15 (79%) of the babies with ABO incompatibility was not performed until the age of 36 hours or more. Of the four babies with ABO incompatibility who received transfusions at less than 36 hours of age, only one had an indirect bilirubin level greater than 15 mg.% at the time of initial transfusion.

This baby required three transfusions. Of the other three babies, none showed a rise as great as 0.5 mg.% per hour in the 12 hours prior to transfusion. In the light of our further experience, it is our impression that these three infants may have not needed replacement transfusion therapy, and we would now undoubtedly "watch" them longer.

Maternal Anti-Rh Titers.—The maternal titers were followed in 11 of the 15 surviving babies with Rh incompatibility who did not require exchange transfusion therapy. One mother had an anti-Rh titer of 1:128 during her last trimester; one had an anti-Rh titer of 1:512; and the remaining nine mothers had titers of 1:16 or less during the last trimester.

Maternal anti-Rh titers were determined in 33 of the 42 cases of Rh incompatibility in which the babies required exchange transfusions. Eight mothers had anti-Rh titers during the last trimester of 1:16 or less, and 25 mothers had titers greater than 1:16 during the last trimester.

Among the seven patients with stillborn babies, one mother's anti-Rh titer was not determined. The titer during the last trimester in all six of the other mothers was 1:4,096 or greater. It is evident from figure 5 that, although there is not always a good correlation between anti-Rh titer and severity of erythroblastosis, a titer of 1:16 or more should at least serve to alert the obstetrician and pediatrician to the possible necessity for transfusion.

Bilirubin Levels.—There was a marked discrepancy in the cord blood indirect bilirubin levels, in the patients given transfusions, between the first and second years of the study. Between October, 1954, and September, 1955, cord indirect bilirubin levels were done on 15 of the 17 babies who received transfusions. Of these 15, only 3 babies had cord indirect bilirubin levels greater than 4 mg.%. In the year ending Sept. 30, 1956, cord bilirubin levels were done on 14 of the 25 babies given transfusions. Of these 14, 10 had cord indirect bilirubin levels of more than 4 mg.%. Those babies on whom cord bilirubin levels were not determined either were clinically very sick, and were given transfusions without awaiting results of bilirubin level determination, or had erythroblastosis not anticipated because of very low maternal anti-Rh titers. Therefore, bilirubin levels, in the latter group, were not determined until the other

cord blood examination revealed evidence of erythroblastosis. It is now our policy to record cord bilirubin levels on very sick babies in an effort to aid in determining the prognostic significance of cord bilirubin levels in future handling of babies with erythroblastosis. In the two-year period, cord blood bilirubin level determinations were made on 6 of the 16 babies with erythroblastosis in whom transfusion was not done. All except one of these indirect bilirubin levels were below 4.0 mg.%. These results are summarized in figure 6.

It is our impression that the lower cord bilirubin levels of babies given transfusion during the first year of the study reveal inexperienced interpretation and lack of security in "watching" these babies and that some of the exchange transfusions done in 1955 could have been avoided. Nevertheless, as has been often stated in the literature, we would far rather have done one unnecessary transfusion

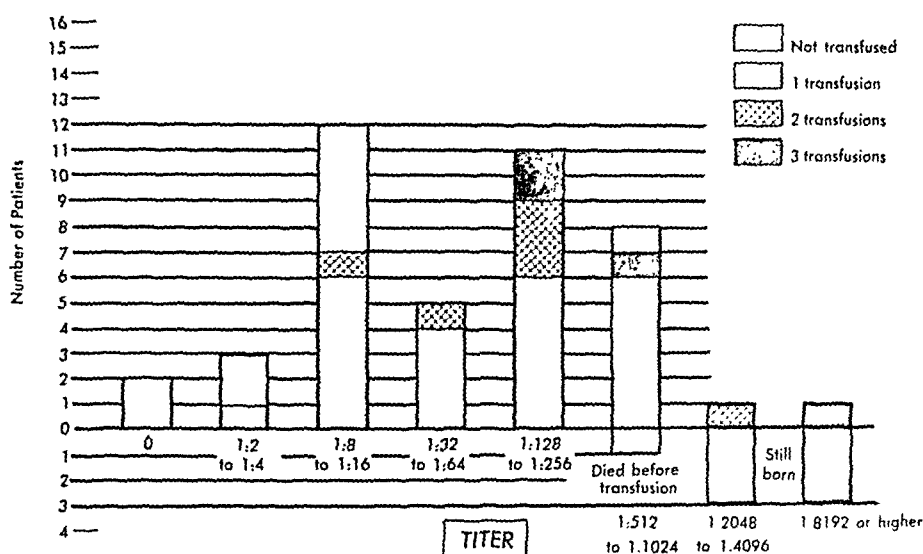


Fig. 5—Relation of anti-Rh titer during last trimester to severity of erythroblastosis in 50 cases.

than have run the risk of one irrevocable instance of kernicterus.

Of the 15 babies with Rh incompatibility who had initial transfusions later than 12 hours of age, only 4 had an indirect bilirubin level of less than 7 mg.% at the age of 12 hours. Of these four, one was the previously described infant whose bilirubin level rose to 23 mg.% at the age of 72 hours. Two others had a history of severe erythroblastosis in previous siblings. One was the mother's fourth baby. Three previous babies, born elsewhere, were normal. (The mother had had transfusions 20 years earlier.) This baby's indirect bilirubin level rose from 2.2 mg.% in the cord to 6.7 mg.% at the age of 13 hours. This baby, in the light of our later experiences, may have been unnecessarily given transfusion.

From these bilirubin determinations, it is our impression that babies with a cord blood indirect bilirubin level of more than 4 mg.% or a level of more than 7 mg.% at 12 hours will ultimately need

exchange transfusion therapy. There were no cases of kernicterus among this series of patients.

Hemoglobin Levels.—There were nine infants who had a level of less than 10 Gm.% of hemoglobin prior to the first replacement transfusion. In this group, four infants died and three of the surviving infants required multiple exchange transfusions. On the other hand, eight other infants had multiple exchange transfusions. In this group, five infants had initial hemoglobin levels between 13.3 and 23 Gm.%. The other three were sufficiently ill, prior to the first transfusion, to warrant doing the procedure on the basis of the clinical picture and the laboratory evidence of the presence of Rh incompatibility and sensitization.

It is our interpretation that an initial hemoglobin level of less than 10 Gm.% is usually an indication of severe erythroblastosis. However, the converse is not always true. Babies with erythroblastosis of sufficient severity to require multiple exchange

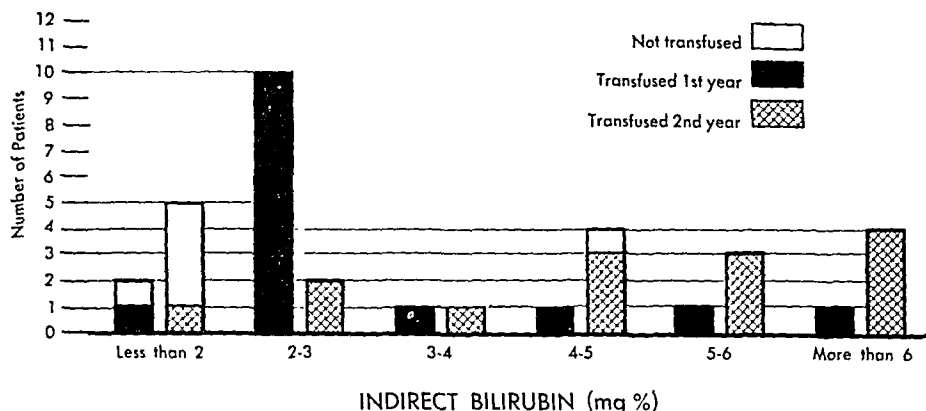


Fig. 6.—Relation of cord indirect bilirubin level to necessity for exchange transfusion in 35 patients with Rh incompatibility.

transfusions to prevent kernicterus do not necessarily have marked anemia early, as their hematopoiesis may be sufficient to maintain their hemoglobin levels. Although we did not routinely obtain reticulocyte counts, it has been brought out by Allen and Diamond¹³ that they are of prognostic value, particularly in those babies with high hemoglobin levels. Exchange transfusions, however, were done largely on the basis of bilirubin levels, and reticulocyte counts probably need not be included among the "minimal requirements" for successful practical management of these babies.

There was no significant correlation between bilirubin and hemoglobin levels after exchange transfusions. These results bear out the fact that much of the hyperbilirubinemia after exchange transfusion therapy is due to mobilization of tissue bilirubin rather than further hemolysis. Since the fundamental purpose of multiple transfusions is to prevent kernicterus, determinations of the hemoglobin levels are of little value late in the course of treated erythroblastosis in assessing the need for further therapy.

Use of Cortisone

During 1956, nine babies were given cortisone intramuscularly in doses varying from 5 to 20 mg. a day for periods varying from 1 to 16 days. No baby was given cortisone as a substitute for transfusion therapy. It was used always in addition to all of the other accepted therapeutic measures.

One infant with mild erythroblastosis, whose indirect bilirubin level had gradually risen to 16.7 mg.% on the third day of life, was then started on doses of 20 mg. of cortisone per day. Twenty-four hours later (on the fourth day) the indirect bilirubin level was 22.4 mg.%, 24 hours after that (on the fifth day) it was 19.6 mg.%, and it gradually fell thereafter. This chain of events might well have taken exactly the same course without cortisone therapy, so this drug was probably of no benefit in the management of this baby.

Two babies who were given cortisone because of poor clinical condition received only one dose prior to death. These had an insufficient amount to permit evaluation of cortisone effect in combating stress.

Two babies with severe clinical hydrops fetalis were started on cortisone as adjuvant therapy at birth. One of these died with a ruptured spleen at 34 hours of age, after three replacement transfusions; the other died with sepsis and pneumonia at

the age of 60 hours, after two transfusions. It was felt that these babies may have survived longer than was to be expected without cortisone and that steroid therapy may be of increasing benefit as we become better able to manage infants with severe erythroblastosis.

Four infants were given cortisone for its possible effect in the inspissated bile syndrome. Two of these babies developed this complication while receiving cortisone therapy, and, in both, the direct bilirubin level began to fall on the fifth day of life.

Two other babies were started on cortisone therapy after the inspissated bile syndrome had already developed and was rapidly increasing in its severity. One of these babies was 4 days old and the other, 15 days. The direct bilirubin level in both of these babies began to drop within 24 hours of the institution of steroid therapy. The baby who had been started on cortisone therapy at 15 days of age had three exchange transfusions in the first two and one-half days of life. The direct bilirubin level gradually rose to 7.2 mg.%, the liver began to increase in size, and the baby

began to vomit. Twenty-four hours after starting cortisone therapy, in doses of 5 mg. every 12 hours, the stools, which had been intermittently grey, became bright yellow, the baby stopped vomiting, and the direct bilirubin level began to fall.

It was our impression that the early fall in direct serum bilirubin level was related to cortisone therapy. One of the original diagnostic criteria set forth by Hsia and co-workers¹⁴ for the "inispisated bile syndrome" due to erythroblastosis fetalis was persistent elevation of the direct bilirubin lasting more than the first three weeks of life. Cortisone is a cholagogue, and its effect may have been on that basis, although in the past other choleretic agents have not influenced the level of direct bilirubin.¹⁵ If one subscribes to the theory

started in all of these babies at less than 2 hours of age. They were all given antibiotics, and three of the four were started on cortisone therapy prior to transfusion. It is this group of babies who have been thought to be not salvable and to be the victims of fatal disease.

It is our feeling that some of these infants should eventually be saved by prompt and adequate treatment by a well-organized and experienced group of pediatricians working in close cooperation with obstetricians, laboratory, and blood bank. Since the period of study covered by this paper, two babies with hydrops fetalis and another infant whose hemoglobin level at birth was 2 Gm.% have recovered without kernicterus or other sequelae. These babies have all had ini-

Summary of Deaths Among 104 Live-Born Infants with Erythroblastosis Fetalis

Case No.	Gravida	Previous Infants	Blood Studies										Age at 1st Transfusion, Hr.	Transfusions, No.	Age at Death, Hr.	Autopsy Findings	Remarks
			Group				Titer	Result of Coombs' Test	Hemoglobin Level, Gm. %	Indirect Bilirubin Level, Mg. %							
			Mother Type	Mother Rh	Infant Type	Infant Rh											
1	4	3 living and well	O	+	A	+	...	—	14	23.2	80	1	120	Atelectasis, bilateral subdural hemorrhages	No prenatal care; indirect bilirubin level 17 mg. % prior to death		
2	2	1 living and well	AB	—	A	+	1:1,024	+	16.7	5.6†	No transfusion		27	None	Born at 6½ mo.; wt. 3½ lb.; died of respiratory failure		
3	5	3 living and well; 1 living with cerebral palsy (had erythroblastosis)	A	—	Not determined		1:236	...	6*	9.6†	1½	3	34	Ruptured spleen, no kernicterus	Hydrops; first transfusion done without awaiting laboratory results		
4	4	1st and 3rd living and well; 2nd terminated in miscarriage	B	—	A	+	1:128	+	9.9*	...	2	2	66	None	Hydrops; bilirubin level dropping during last 24 hr.; died of pneumonia and sepsis		
5	4	1st and 3rd living and well; 2nd stillborn	A	+	O	+	...	+	8.4*	7.3†	2	1	3	Hepato-splenomegaly, extra-medullary hematopoiesis	Hydrops; mother negative; baby positive; died 45 min. after transfusion started		
6	3	1st living and well; 2nd stillborn, with erythroblastosis	A	—	O	—	1:64	+	5*	2.7†	1	1	2	None	Hydrops; died 49 min. after transfusion started		

* At birth.

† At 12 hours of age.

‡ Cord blood.

that the high level of direct bilirubin in these babies is due to parenchymal liver cell changes rather than to plugging of the bile canaliculi, one might attribute the improvement noted in these infants to the anabolic effect of cortisone, with perhaps more rapid liver regeneration.

Deaths

There were six deaths among the 104 live born babies on whom the diagnosis of erythroblastosis was made, resulting in an over-all mortality of 5.8%, a mortality of 2.2% in the babies with ABO incompatibility, and a mortality of 8.6% in those with Rh incompatibility. These cases are summarized in the table.

It is evident that, in the infants whose deaths can be actually attributed to erythroblastosis fetalis, the disease was present in its most serious form. Initial exchange transfusion therapy was

tial transfusions within one to two hours after delivery. After these initial transfusions, they were allowed a period of two to three hours for post-operative recovery and have then been given second replacement transfusions, far earlier than in our past experience. It is our present working hypothesis that babies with hydrops fetalis are not too sick to be given transfusions but that rapidly repeated replacement transfusions may be lifesaving.

Since the period of this study, early induction of labor has become an important factor in the salvage of babies with potentially severe erythroblastosis. As contrasted to the use of induction in the early studies of erythroblastosis, this method is now rarely attempted prior to the 37th or 38th week of pregnancy. This timing has been found optimum in order to achieve a "happy medium" between the disadvantages of erythroblastosis in a premature infant and the increasing severity of

the process during the last three weeks in utero. As time goes on, properly timed induction will undoubtedly be lifesaving in babies whose mothers have previously had infants with severe erythroblastosis and whose titers give evidence of another severely sensitized baby.

Comment

Until recently, the management of babies with erythroblastosis has been undertaken almost entirely by large teaching hospitals, which have served as referral centers for babies from large surrounding areas. It has thus been necessary to set forth certain instructions for the local hospitals with regard to care of the cord, obtaining of blood samples, and other procedures prior to transporting the infants to the treatment center, and the time consumed in transfer of these babies has sometimes interfered with their optimum treatment. It has been the general feeling that the severely ill babies with hydrops fetalis and cardiac failure are too sick to be treated and that death is inevitable before exchange transfusion can be started. It was the aim of this paper to record the experience of a group of practicing pediatricians in the management of erythroblastosis fetalis in a community hospital.

It is difficult to compare our mortality statistics with those of other groups, as their results frequently refer only to those babies who were given replacement transfusions, which automatically exclude the severely ill babies who were felt to be moribund and "too sick to be given transfusions." In other series, such as that of Wiener and associates,¹⁶ the statistics have been broken down according to differences in severity of illness in the various treated groups, without presentation of an over-all mortality. Our results, with a mortality of 5.8%, compare favorably with the latter report and with a group similar to ours, reported by Feldman and co-workers⁶ in 1954, in which there was a mortality of 6.6% and also with a group recently reported by Kelsall and others,¹⁷ with a mortality of 11.9%. It should be reiterated that we have had no patients develop kernicterus with our methods of management.

The most important major requirement for effective management of these babies in a community hospital is coordinated teamwork (with 24-hour availability of all concerned) between the obstetrician, the attending pediatrician, the pediatricians on the exchange transfusion team, the diagnostic laboratory, the blood bank, and the nursery and delivery room personnel. This is one of the rare pediatric diseases in which elimination of wasted time may be lifesaving.

The minimum laboratory techniques required for proper practical management of these infants are not numerous and are usually available in most hospitals. In order to predict possible erythroblastosis fetalis during pregnancy, one must be able to determine maternal blood group, Rh factor, and anti-Rh titer.

In order to substantiate the diagnosis of suspected Rh incompatibility at birth or to diagnose Rh or ABO incompatibility in babies with jaundice during the first 24 hours or undue jaundice during the first five days, one must be able to determine the baby's blood group, Rh factor, Coombs' test result, hemoglobin level, and serum direct and indirect bilirubin levels.

The actual performance of an exchange transfusion requires a certain amount of technical skill. The experience of doing some replacement transfusions, however, is now almost inevitably included in a pediatric residency. The multiple minor technical skills which can make the procedure go smoothly and the ability to recognize and correct the technical difficulties which can slow the transfusion are easily acquired, but only with experience. It has been the feeling in this hospital that it is advisable to have all babies with erythroblastosis or suspected erythroblastosis given follow-up studies by a small group of pediatricians and also given transfusions by this group, as good clinical judgment and technical skill can best be acquired by frequent experience on the part of a few as compared to rare experience of many. The procedure can be thus performed in a shorter time, with less trauma to the infant. It must be remembered that, with increased skill in management of the mechanical procedure, the transfusion may progress very rapidly, and it becomes necessary to consciously slow down. A more efficient bilirubin exchange results if at least one hour is consumed in the procedure.

The facilities and instruments necessary for performing exchange transfusions are available in any hospital and include a few simple surgical instruments, sterile polyethylene catheters, 10% calcium gluconate solution, blood group specific substances A and B, and available donors of type O, Rh-negative blood. The adjuvant requirements for effective transfusion therapy and for follow-up care include oxygen, facilities for warming the infant, antibiotics, digitalis, and cortisone. It should be reiterated that, as a practical aid, the advantages of leaving the catheter in situ until the baby's condition is stabilized may outweigh its dangers. Another practical point which has lessened our technical difficulty is the omission of feeding of these infants in order to prevent aspiration. The one most important follow-up laboratory test, for babies with erythroblastosis given transfusions and those not requiring transfusion, is determination of the serum bilirubin level.

The decision as to the necessity for and the optimum time of replacement transfusion therapy remains the largest and most important problem in the management of these babies. Now that the problem has resolved itself into correction of anemia, correction of cardiac failure, and prevention of kernicterus by prevention of hyperbilirubinemia with levels greater than 20 mg.%, these decisions can be made by any experienced group with avail-

able adequate laboratory facilities. As has been repeatedly stated in the literature, no one criterion can be used in making these decisions and in each infant all factors must be considered. In general, we have adopted the following indications for initial exchange transfusion of a full-term baby: (1) unequivocal—clinical hydrops fetalis, cardiac failure and profound anemia, and indirect bilirubin level greater than 20 mg.%; (2) reliable—cord blood indirect bilirubin level greater than 4 mg.%, indirect bilirubin level more than 7 mg.% at the age of 12 hours, rise in serum indirect bilirubin level of more than 0.5 mg.% per hour, and birth hemoglobin level of less than 10 Gm.%; and (3) helpful but unreliable, and not to be used without reliable indications—rising maternal anti-Rh titer during last trimester, maternal anti-Rh titer at term of more than 1:16, and history of previous infants with erythroblastosis. The following indications have been adopted for multiple exchange transfusions: (1) indirect bilirubin level greater than 20 mg.%, (2) rise in indirect bilirubin level of more than 0.5 mg.% per hour, and (3) poor clinical condition of the infant.

The use of these criteria will result in more prompt initial transfusion therapy in the future, and there will probably be fewer multiple transfusions. Also, the use of these criteria will give more security in watching babies with erythroblastosis whose bilirubin levels are below those set forth at the various ages. The ultimate result in the next few years will be a decrease in the number of babies with erythroblastosis given transfusions.

The use of cortisone as an adjuvant treatment (along with the continued effort to give transfusions early and as frequently as necessary) in the management of babies with very severe erythroblastosis should be further investigated. Previous reports of the use of steroid hormones in these babies refer only to their lack of value in decreasing hemolysis. We feel that cortisone may prove invaluable in combating stress before the anemia is corrected. No reports of cortisone in treatment of the inspissated bile syndrome are available, but it is our experience, from this study as well as from more recent use in even larger doses (20 to 30 mg. per day), that it exerts a definite beneficial effect. It should be pointed out that it is imperative that prophylactic antibiotics be given along with steroid therapy.

Summary and Conclusions

A study has been made of 111 infants, with erythroblastosis fetalis, born during a two-year period in a community hospital. It was found that erythroblastosis due to Rh incompatibility is diagnosed and treated earlier than that due to ABO incompatibility. Because early exchange transfusion to remove sensitized cells in babies with disease due to Rh incompatibility is more efficient than late exchange transfusion to remove bilirubin, criteria for early diagnosis and prediction of dan-

gerous hyperbilirubinemia have been developed. These criteria are important in decreasing the number of unnecessary exchange transfusions. Babies previously considered "too sick to be given transfusions" should be treated promptly. Cortisone is of probable benefit in the management of sick babies and in treatment of the inspissated bile syndrome.

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CLINICAL NOTES

CLONIC CONVULSIONS AFTER THE ORAL USE OF PERPHENAZINE (TRILAFON)

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and

William D. Gentry Jr., M.D., Baltimore

There is a perpetual endeavor on the part of the clinician and the pharmaceutical houses to find a drug or combination of drugs that will effectively combat the annoying symptoms of nausea and vomiting. The phenothiazine group of drugs has been received with a good deal of enthusiasm for the management of hyperemesis resulting from a wide variety of causes, and no one specialty has been alone in reporting findings after the clinical investigation of these drugs.

Perphenazine is one of the newer drugs falling into the phenothiazine group and has been demonstrated to be 16 to 48 times as effective as chlorpromazine (Thorazine) against drug-induced vomiting¹; its greater effectiveness increases in proportion with the dose of the emetic stimulus. It is, furthermore, a versatile antiemetic and has been reported to be effective against a variety of drugs¹ in the prevention and management of nausea and vomiting after surgical anesthesia² and as an antiemetic agent in terminal cancer where other of the phenothiazine drugs have failed to provide relief.³

For the purpose of keeping clinicians informed as to the possible side-effects which patients may experience in association with the use of perphenazine, we present a case of prolonged convulsions after its use in the treatment of the nausea and vomiting of pregnancy.

Report of a Case

A 21-year-old woman, six to eight weeks pregnant, was admitted to the hospital with the chief complaint of generalized clonic convulsions. During the previous week she had been experiencing early morning nausea and vomiting, although these had not progressed to the degree that she was incapacitated or unable to retain food and liquids. On consulting her private physician, she was given a prescription for perphenazine (Trilafon Reptabs), 8 mg., with directions to take one tablet twice a day, in the morning and in the evening. The first dose was taken at 4:30 p. m. on Aug. 27, 1958, and by the following morning the patient was free of any symptoms of nausea. At 8:30 a. m., the second 8-mg. dose was taken, and by 3:30 p. m. she noted a sensation of lightheadedness and some subjective difficulty in "getting my breath." At 6 p. m. the third tablet was taken, after which she ate dinner. Shortly after dinner the patient went shopping, at which time her husband noted a fine tremor of her jaw. She immediately went home and took two tablets containing acetophenetidin, acetylsalicylic acid, and caffeine (Empirin compound). Tremors soon involved her neck muscles and then the muscles of her entire body. These eventually gave way to generalized clonic convulsions. At no time did the patient lose consciousness or the ability to voluntarily move her hands or feet. Her

head assumed a position of hyperextension, with her eyes rolled upward. Her physician was called, and she was immediately sent to the hospital. The patient had no history of epilepsy or previous motor seizures and denied any such findings in her family history.

Physical examination revealed a well-developed, well-nourished, and hydrated female with generalized rigidity in an opisthotonoid position. There were fine tremors noted over her entire body. Her rectus muscles were board-like in consistency. She was conscious and readily responsive. Blood pressure on admission was 120/80 mm. Hg, and pulse rate was 78 per minute. Respirations were not remarkable. The only positive findings were in the neuromuscular system. The knee and ankle jerks were hyperactive; Babinski's signs were not present.

After admission, the patient was given 120 mg. of phenobarbital intravenously along with 10 mg. of morphine sulfate intramuscularly. There was then an abatement of the convulsive episode, although the tremors persisted. Phenobarbital administration was repeated intramuscularly in 32-mg. doses twice during the night, and by morning the tremors had disappeared. The same dose was again given once during the day, when fine tremors again were noticed to involve both legs.

The urinary output was measured during the first 12 hours and was found to be adequate. The patient was discharged on the morning of Aug. 30, 1958, at which time her only complaint was the recurrence of her morning sickness.

Comment

Perphenazine is closely related to chlorpromazine, both of which derive from the phenathiazine group of drugs. Barrett⁴ recently reported two cases of convulsive seizures after the administration of therapeutic doses of chlorpromazine to patients who, after full recovery, showed electroencephalographic tracings consistent with convulsive disorders. He stressed the epileptogenic properties of chlorpromazine and the danger of prescribing the drug to persons known to have convulsive tendencies. Extrapyramidal and epileptiform symptoms have also been reported after the use of perphenazine in the same dosage range but for longer periods than described here.⁵ The symptoms promptly disappeared within 24 hours after discontinuance of the drug therapy. In some cases, by reduction of the dose the therapeutic effect was achieved without the accompanying side-effects.

It is evident that the dose of 8 mg. of perphenazine given twice a day was sufficient to elicit the epileptiform manifestations in the patient reported here. On withdrawal of the drug these symptoms disappeared, but the original complaint of nausea reappeared and remained despite other drug therapy. This case demonstrates the importance of instructing and cautioning office patients or outpa-

From the Anesthesiology Department, the Hospital for the Women of Maryland. Dr. Gentry is visiting obstetrician.

tients as to prodromal or warning signs of abnormal extrapyramidal and epileptiform activities. Prompt reduction in the dosage, along with barbiturate supplementation, might avert the grosser disorders while allowing the patient the benefits of antiemetic medication.

Summary

A woman with emesis gravidarum, in her eighth week of pregnancy, was treated with three divided doses of perphenazine, 8 mg. each. After the last dose she developed a sustained convulsive seizure, which was successfully treated by the withdrawal of the drug and the administration of a long-acting barbiturate and morphine sulfate. Drugs of the phenothiazine group have been reported to have an epileptogenic effect on persons with convulsive tendencies as diagnosed by the electroencephalogram, even though there is no history of epilepsy or motor seizures. Recovery may be quickly accomplished by withdrawal or reduction in dosage of the drug along with supplemental barbiturate therapy.

Hospital for the Women of Maryland, Lafayette at John Street (17) (Dr. Graff).

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DOUBLE LUMEN CATHETER FOR USE WITH ARTIFICIAL KIDNEY

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and
Ernst Peschel, M.D., Durham, N. C.

Hemodialysis by means of an artificial kidney has become a well-established adjunct in maintaining life and reducing morbidity during the oliguric phase of reversible renal failure.¹ Some kidney units such as that developed by Skeggs and co-workers² and Kolff and Watschinger³ utilize a pump to propel the patient's blood through the dialyzing tubing. This modification permits venous blood to be utilized for outflow to the artificial kidney. A pump or negative pressure surrounding the dialyzing membrane⁴ incorporates ultrafiltration into the procedure of hemodialysis, making possible the reduction of otherwise intractable edema.⁵

Hemodialysis is time consuming. This factor limits to some extent the availability of the procedure. The period of actual dialyzation with presently available methods cannot be appreciably reduced. It is doubtful whether more rapid rates of clearance are physiologically desirable. However, any time that may be saved in preparing the instrument or the patient for the procedure would be a distinct advantage.

Most clinics utilize two peripheral vessels for hemodialysis; one for outflow to the artificial kidney

and one for return from the unit.⁶ Two cut-downs are obviously time consuming and predispose the patient to infection at two sites. The use of a double lumen catheter has been suggested by Rosenak⁷ but such a technique has not been generally adopted.

The present report describes a double lumen catheter that may be introduced into the saphenous vein at the fossa ovalis and passed into the inferior vena cava. This catheter, made with nontoxic vinyl plastic, may be autoclaved. The over-all length is 59 cm. The distal end is a single lumen and has an outside diameter of 3.99 mm.; a second lumen opens 19 cm. from the distal end. Small openings are placed along the side before the major orifice of this lumen to prevent the wall of the vein from being aspirated over the opening. The double lumen section is ovoid and measures 6.65 mm. on the major axis and 4.98 mm. on the minor axis. The inside diameter of both lumina is 2.31 mm. The catheter is made to fit the connectors of the Kolff disposable twin coil unit.

Introduction of this catheter has presented no technical problems in adults. Similar large catheters are used in cardiovascular surgery. The technique for the cut-down is therefore well known to surgeons and will not be described.

From the Cardiovascular-Renal Laboratory, Department of Medicine, Duke Medical Center. Dr. Berry is a research fellow of U. S. Public Health Service.

The blood returning from the artificial kidney may possibly mix with blood going to the unit and thereby modify the concentration of solutes in the latter blood. Such contamination with dialyzed blood would reduce the gradient of solutes across the dialyzing membrane, decreasing the clearance rates and efficiency of the procedure. Such mixing of blood could possibly be minimized if a considerable inflow of blood entered the vena cava between

concentration of nonprotein nitrogen in the arterial blood and blood flowing to the artificial kidney were similar no significant mixing occurred. It can be seen that significant mixing occurred in only one patient (case 4).

Evaluation of Mixing of Inflow and Outflow of Double Lumen Catheter

Case	Date	Initial Nonprotein Nitrogen Level, Mg. %	Duration of Dialysis, Min.*	Nonprotein Nitrogen Level, Mg. %		
				Inflow to Artificial Kidney	Inflow to Patient	Peripheral Artery
1	5/7/58	275	78	150	72	142
2	5/13/58	203	95	183	125†	188
3	6/14/58	260	106	118	77	120
4	6/21/58	295	87	147†	86	195

* When observations were made.

† Suggests mixing.

‡ Suggests low flow. Patient was in congestive failure and maximum ultrafiltration was desired. During four hours of dialysis, patient lost 3.6 kg. (8 lb.).

Comment

This double lumen catheter has been used on nine occasions in seven patients. The results of these procedures compared favorably with procedures in which separate catheters were used. Flow in each patient was entirely satisfactory. Hypotension appears to be less of a problem when blood is removed from the venous rather than the arterial system. Bleeding from the venotomy at the termination of the procedure could usually be controlled by pressure. Ligation of the vein was necessary only on one occasion. No evidence of thrombosis was apparent.

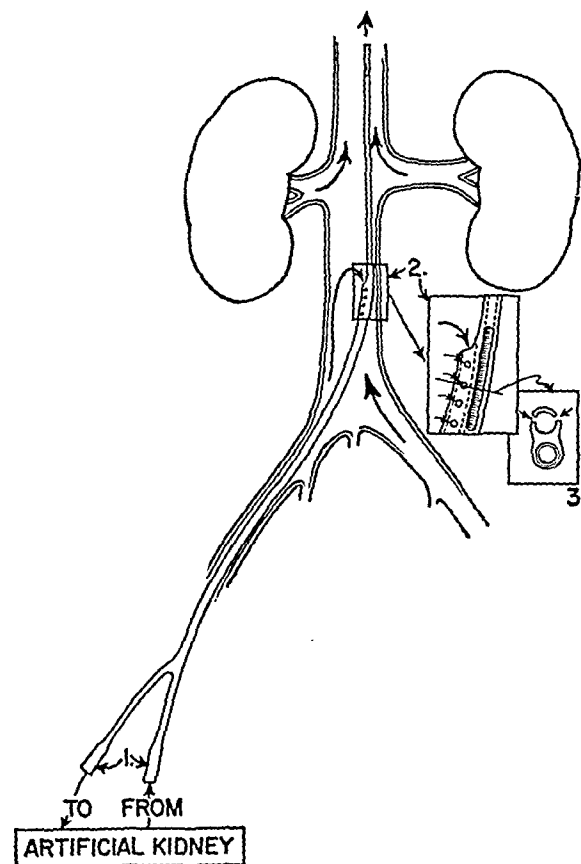
M Box 3414 (Dr. McIntosh).

The catheter used in this study was made by the U. S. Catheter and Instrument Corp., Glen Falls, N. Y. The Kolff unit was made by the Travenol Laboratories, Inc., Morton Grove, Ill.

This study was supported in part by grants from the American and North Carolina Heart Association and the Carolina Chain-Saw and Equipment Co., Shelby, N. C.

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Double lumen catheter introduced into saphenous vein at fossa ovalis and passed into inferior vena cava. (1, connectors for catheter; 2, outflow from patient; 3, cross-section view showing side openings).

the orifices of the two lumina. An attempt is therefore made by external measurement to position the catheter so that the inflow to the patient is cephalic to the renal veins (level of umbilicus) and the outflow to the artificial kidney is caudal to those veins (see figure).

In three patients dye was injected into the tubing returning blood to the patient while blood to be analyzed for dye was simultaneously drawn from tubing carrying blood to the artificial kidney. No dye was recovered in two studies while a trace of dye was recovered in the third. The possibility of mixing was further evaluated on four occasions by comparing the nonprotein nitrogen concentration of the blood flowing to and from the artificial kidney with the nonprotein nitrogen concentration of peripheral arterial blood (see table). If the con-

MEDICINE AT WORK

- **Animals in Research**
- **Bettering School Health**
- **Medicolegal Conferences**
- **Blood Services Listing**
- **Health of Workers**
- ✓ **SPECIAL REPORT—Snow**

Case of the Elusive EKG

Keeping TV's forays into medicine at least plausible, if not completely accurate, is no mean job—as the A. M. A.'s Physician Advisory Committee on Television, Radio and Motion Pictures has found (see *Medicine at Work*, THE JOURNAL, May 4, 1957).

Its policy of "help, not yelp" has had effect. But the policy backfired recently in an unusual way because of a television drama based on a mistake—that of confusing a healthy man's electrocardiogram with that of a fellow with a serious heart ailment. The story's patient—upon being told the "good news"—proceeds to live it up to the point of expiration. Meantime, having discovered the error, his physician futilely searches for the hero.

The Committee detected that improbable incident in script form and suggested the network discard the basic idea as being highly unlikely. The request was observed—with thanks. No sooner had the Committee breathed a sigh of relief than it found another network had produced a film based on the same script. Efforts to have it edited in the name of credibility were fruitless, since the completed film represented a heavy investment which the network felt it could not write off. So, some 40 million viewers watched the hero die because of an incredible clerical mixup.

The experience was related by Dr. Eugene F. Hoffman of Los Angeles, chairman of the A. M. A. Committee, in a talk before the Multnomah County Medical Society in Portland, Ore.

Barbecues, Bake Sales, Essays

Pennies and Dollars Bring a Medical Center to Wilcox County

For the first time in its history, rural Wilcox County in Georgia now has a medical center. It climaxes a long struggle to provide better health services and marks the kind of challenge which scores of other communities have met and conquered (see *Medicine at Work*, THE JOURNAL, Sept. 29, 1956).

Rochelle, largest of five towns in the county and one of the most centrally located, had no physician. Anxious to correct this situation, its citizens made sporadic but unavailing attempts at some solution. In 1950, hopes for a 25-bed hospital under the Hill-Burton plan were dashed when a survey proved unfavorable. But, by 1956, a Wilcox County Health Committee prevailed on the state health department to survey its needs. One survey recommendation was that a county health facility be located in Rochelle.

It turned out that state and federal funds were available to help pay the cost of the center if (1) the county would appropriate \$15,000 for the facility and (2) the people themselves could raise \$15,000 more and provide the land. The county government appropriated its share, but, with 8,500 population and an average family income of \$935 a year, raising money in Wilcox County was no mean feat. However, its citizens set to their task with a will.

Dr. David Henry Poer of Atlanta, writing in the *Journal of the Medical Association of Georgia*, tells of their efforts:

—A service club pledged \$1,000 and made good through a raffle, pest control projects, and a variety show.

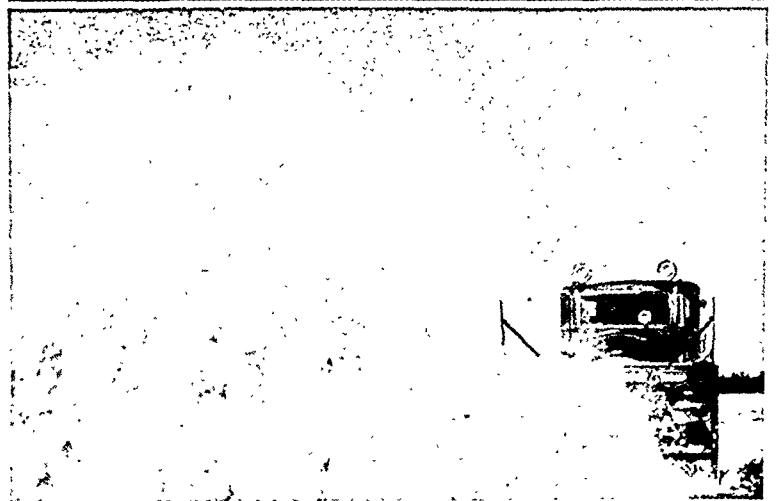
—A woman's club sold shrubbery, cakes, cookies, pies, and candy.

—A DAR chapter held a barbecue and also offered money from an unused student loan fund.

—A teacher organized a medical center club, and each child donating a dollar got his name on a big poster and printed in the local paper.

—School children saved their pennies, made posters, and wrote essays to promote the campaign.

—Residents who had moved away came through with contributions



This is snow—joyful, lovely, tender, and pure. It also can be an ingredient of crisis, menacing the health of masses of people. A special report on page 843, "Snow Emergency," documents three such incidents. (National Safety Council photo)



The happiness displayed by Dr. Philip S. Woodbury and his family was shared by the rest of Georgia's Wilcox County when the physician opened a practice in quarters which the townspeople had worked so hard to provide.

based on their understanding of the need.

The \$15,000 was raised. When original plans to have both the clinic and the physician's office under one roof were changed, it was decided to put the hard-raised money into the doctor's building. Two sites close to each other were donated by residents, and the Sears Roebuck Foundation offered architectural plans. When a leading group of citizens found itself \$8,000 short, it borrowed the money on the strength of expected repayment from rent when a doctor could be found.

Even with the new facilities, Rochelle and Wilcox County found difficulty in attracting a physician. Several visited the town but did not stay for one reason or another. Then Dr. Philip S. Woodbury arrived fresh from a general practice residency in California. He had heard about Rochelle's need through the A. M. A. Physician's Placement Service. The A. M. A. directed him to the placement service operated by the Medical Association of Georgia, and Dr. Woodward and his family were wooed and dined by the citizenry of Wilcox County. It wasn't long before both town and physician felt they had found the perfect match.

As the only active physician in that part of the county, Dr. Woodbury sees busy days ahead. In fact, he already plans to scout up another young general practitioner to help out.

Meeting a Great Need

Directory of Blood Services Emerges from Two-Year Study

The widespread use of blood as a therapeutic agent was a phenomenon of the World War II era. Thousands of American physicians in uniform saw soldiers recover after lengthy surgical operations made possible only by blood transfusion. Returning to civilian practice at war's end, these doctors sought blood sources for their own patients.

This recent history lies behind the publication last month of the nation's first comprehensive directory of blood facilities, a document issued by the Joint Blood Council. Within its pages, in tabulated form, is detailed information designed to fill the need of physicians, hospitals, and others interested in the availability of blood and its derivatives.

Publication of the directory—based on 2,202 replies to questionnaires sent to the nation's 3,150 institutions offering blood services—is a measure of the progress achieved by the Joint Blood Council which was established in 1955. One of its first actions was a postal card survey of blood usage in the United States during 1956. With this as a base, the Council undertook a two-year study of blood bank resources across the nation. The survey was financed by a \$50,000 grant from the U. S. Public Health Service.

The study was sorely needed. While progress in blood transfusion services was being made locally, there was no satisfactory national program for the exchange of blood. Worse yet, perhaps, nomenclature and standards varied. The definition of a "unit" of blood for transfusion varied with the locality, and safe collection and storage standards had not been established.

The preparation of standards for accreditation of blood banks, development of a glossary of terms, and an inventory of research projects in blood and derivatives were among the objectives of the Joint Council. Reaching these objectives demanded information, and information was the prime purpose of the now-completed survey.

The Joint Blood Council has five members—the American Medical Association, the American Association of Blood Banks, the American Hospital Association, the American National Red Cross, and the American Society of Clinical Pathologists.

Four of these members were signatories, in 1950, of the so-called Boston Agreement, a national plan for the shipment of safe, whole blood. The plan was created to meet the emergency presented by the war in Korea. The Boston Agreement remained the official policy of these organizations even after

the war ended, but by 1955, it became apparent that differing interpretations of its language and intent made something more necessary. That "something more" became the formation of the Joint Blood Council.

Publication of the directory is only one step in a plan envisioned by the Council. Other aims are:

-To develop ways and means to make blood and its derivatives available to all persons in the United States.

-To stimulate and advise on areas of research in the collection, preservation, and use of blood and its derivatives.

-To encourage the public donation of blood for civilian and defense requirements.

-To serve upon invitation as an advisory group to federal and military agencies having to deal with blood and its derivatives.

The efforts of the Joint Council have not gone unappreciated by the nation. In 1956, President Eisenhower wrote a letter to Dr. Leonard Larson, council president, and now Chairman of the A. M. A. Board of Trustees. The President termed the council's program "a humanitarian effort in keeping with the American tradition."

Socioeconomics—County Style

What are the present and future problems facing voluntary medical and surgical insurance plans? How do "third party" medical plans work out? What are a physician's responsibilities to his community outside the field of medicine? (See *Medicine at Work*, THE JOURNAL, March 16, 1957.)

Those are only a few of the program topics planned for the 1959 meetings of the Montgomery County (Ohio) Medical Society under a new plan begun this year. "There are dozens of scientific meetings every month," says Dr. A. J. Carlson, president of the society, "so we've decided to use our meetings as a means of approaching other aspects of medical life, those in the socioeconomic field."

Speakers scheduled so far include Dr. Norman Welch, vice-speaker of the A. M. A. House of Delegates and president of the national Blue Shield program; Arthur J. Clephane, legal counsel for the Pennsylvania State Medical Association; and Dr. John DeTar, past president of the American Academy of General Practice.

Scientific sessions are not being forgotten in Montgomery County, however. The medical society's 10 specialty sections will still hold them, as will hospital staffs and sections.

Mental Health in Rural Setting—In Practice and in Future

Visitors to next month's National Conference on Rural Health will be offered two viewpoints in the mental health spectrum. Dr. Alonzo Peeke of Volga, S. D., will speak on "Mental Health as a Part of General Practice," and Dr. Prescott Thompson, director of outpatient service at the Menninger Clinic in Topeka, Kan., has chosen "Horizons in Mental Health" as his topic.

Representatives of national farm, educational, research, and publishing organizations from some 20 states are expected to take part in the 14th annual meeting sponsored by the A. M. A. Council on Rural Health.

"Experiment in Community Health Participation," a panel discussion, will be devoted to an explanation of how one Kansas community took a long look at its health status, narrowed its sights to its paramount problem, and proceeded to do something about it. Workshop sessions will encourage conferees to outline similar situations and tell of efforts made toward solutions.

Other topics will include "The Do It Yourself Age" by Earl Butz, dean of agriculture and director of the agricultural extension service at Purdue University; "Family Physician and the Cost of Medical Care" by Dr. Conrad Barnes of Seneca, Kan.; "The New Era of Aging" by Dr. Frederick Swartz of Lansing, Mich., Chairman of the A. M. A. Committee on Aging; and "Progress in the Control of Some Diseases of Animals Affecting Rural Health" by Martin Hynes, D.V.M., of Raleigh, N. C.

Health of Workers

Representatives of the American Medical Association are joining those of 63 other health agencies in a discussion of "The Health of People Who Work." The occasion is the eighth National Health Forum sponsored by the National Health Council in Chicago March 17 to 19.

The Forum will be concerned with the challenges of occupational health. Group discussions will be held on such topics as how to evaluate occupational health programs; the responsibilities of management, labor, and other groups in the area of occupational health; and who needs to do what about such new occupational hazards as radiation and air pollution.

The A. M. A. recently reaffiliated with the NHC, which was established in 1921. The membership also includes such major health agencies as the American Dental Association, the American Public Health Association, the National Society for the Prevention of Blindness, the American National Red Cross, and the Arthritis and Rheumatism Foundation.

Best Is None Too Good For Animals Used in Research

The conditions under which laboratory animals are bred, housed, fed, treated, and transported are of vital concern to the scientist whose experimental findings may be invalidated by undiagnosed disease. This was the motivating force behind the formation nine years ago of the Animal Care Panel.

Meeting in Chicago last December for its annual session, the panel's more than 500 registrants represented all walks of scientific life. Research scientists, veterinarians, laboratory colony superintendents, animal breeders, technicians, and manufacturers of laboratory supplies attended the three-day symposium devoted to advancements in the care of laboratory animals.

The interest of the medical profession in laboratory animal condition is exemplified by the aid and encouragement given to the Animal Care Panel by the National Society for Medical Research, which publishes the panel's proceedings. The A. M. A. is a member of NSMR, and Dr. Lester R. Dragstedt, a member of the A. M. A. Council on Medical Physics, is president. Dr. Edward L. Turner, Secretary of the A. M. A. Council on Medical Education and Hospitals, is a member of the NSMR board of directors.

The Animal Care Panel's contributions to medical and biological research were amplified at the December meeting by Dr. L. T. Coggeshall, dean of the division of biological sciences at the University of Chicago. He enumerated its accumulation of information about laboratory animal husbandry, its contributions to a development of standards, its development of teaching programs and visual aids, and its work in developing a better public climate for animal research.

Dr. John L. Schmidt told the panel that a major challenge to the cardiovascular research scientist is the finding of animal species most likely to yield new information about heart and blood diseases. The importance of using several species has been pointed up by a number of studies, Dr. Schmidt said, and special breeds of small pigs are being developed that may prove valuable. He also told the group that the baboon may ultimately prove to be the ideal animal for certain studies (see box).

The use of tranquilizers to prolong the duration of anesthesia in laboratory surgery on animals was described by William C. Dolowy, D. V. M. The duration of anesthesia when pentobarbital is administered alone in rabbits and rats is 14 and 20 minutes respectively. By administering chlorpromazine along with the barbiturate, however, Dr. Dolowy said anesthesia can be prolonged to 44 minutes in rabbits and 200 minutes in rats. Strangely enough, these laboratory animals required an effective dose of up to 50 times more chlorpromazine

per pound of body weight than do humans.

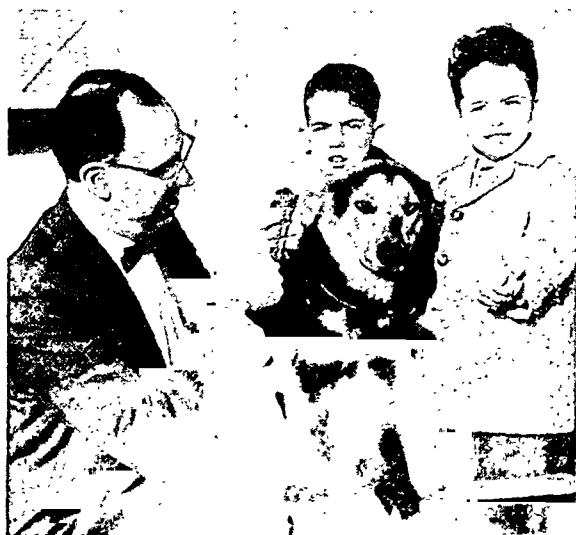
The assembled panelists also heard a report on WARDS, a newly-formed volunteer group of physicians and laymen interested in promoting high standards of care for laboratory animals.

Not all of the panel's problems yield to scientific solution, however. One for which there appeared no ready answer was pointed out in a report by Alan A. Creamer, D. V. M. In a 34,000-mile trip devoted to an inspection of the methods and facilities used in the trapping and shipping of monkeys for laboratory use, Dr. Creamer said he found that, in suggesting conditions for handling of monkeys, "We are asking the trappers to feed the animals better than they themselves are fed."

Baboons and Fats

The discovery that baboons, even though vegetarians, get fatty deposits in their blood vessels, a condition which marks atherosclerosis in humans, sent a team of research scientists to Africa last month. Dr. N. T. Werthessen, his research-assistant wife, and Dr. John B. Janusch made month-long biochemical studies designed to determine the baboon's blood vessel mechanism of handling fats.

Dr. Werthesen is chairman of the department of physiology and biochemistry at Southwest Foundation for Research and Education, which maintains a branch laboratory at Kibwezi in Kenya. Dr. Janusch is a physical anthropologist at Yale.



Big Ben, a mostly German Shepherd, was named Research Dog Hero of 1958 and presented with an honorary collar last December by the National Society for Medical Research. Ben was the subject of a Tulane Medical School's experiment in brain perfusion, a method of cancer treatment. In this technique, a portion of the body is isolated from the circulatory system, supplied by a heart-lung machine, and treated with above-normal dosages of anti-cancer drugs. Shown with Ben are Dr. Robert F. Ryan, instructor in surgery at Tulane, and the retired research dog's two present owners.

Better Health in Schools— Via Physician-Educator Rapport

They'll be editing the fifth edition of a long-lived and influential textbook when the Joint Committee on Health Problems in Education meets next month. Established in 1911 by the American Medical Association and the National Education Association, the Joint Committee has functioned continuously ever since. It is one of the oldest efforts in joint activity of either parent organization.

Most of the annual session March 9 to 11 in Chicago will be given over to a critical review of manuscripts for the upcoming edition of "Health Education," a standard reference and authoritative guide first published in 1924. Publication of the new edition is set for next year.

Editors for the latest revision will include Bernice Moss, Ed.D., professor of health education at the University of Utah. She is a former member of the Committee and was its Chairman when the fourth edition was published in 1948. Other editors are Warren Southworth, Dr.P.H., professor of health education at the University of Wisconsin, and John L. Reichert, M.D., practicing pediatrician. Dr. Reichert is a former chairman of the School Health Committee of the American Academy of Pediatrics and is now a member of the Chicago Board of Education.

Various phases of the text writing have been assigned to acknowledged authorities in the field. The contributions will appear unsigned in the final manuscript.

Although it has other concerns, publications have been a major part of the work of the Joint Committee since its birth. In addition to "Health Education," it has also edited and published such companion volumes as "School Health Services," "Healthful School Living," and "Suggested School Health Policies."

In addition to its book list, the Joint Committee offers a wide range of pamphlets on health subjects of interest to educators. These cover such diverse subjects as the role of the nurse in the school, health aspects of the school lunch program, health problems in physical education, health appraisal of school children, sleep in children, and a series of five pamphlets on sex education.

The publications—ranging in price from five cents (some are free) to five dollars—are all currently available, and new ones are periodically being developed. Others are now in the process of revision. Still others have outlived their usefulness and have been discontinued.

Additional pamphlet topics up for consideration at the March meeting will be "Health Examinations of School Personnel," "Nature of the Child in Re-

gard to School Experience," "Pupil Transportation," and "School Health Committees."

By no means has publishing been the Joint Committee's only effort toward better health in schools. Its history is studded with statements and resolutions on problems of interest and importance to pupils and teachers. Some of the more recent include a resolution on boxing in high schools, a resolution on animal experimentation, a statement on the use of tampons, a resolution on average daily attendance, and statements on general athletics and athletics for girls.

In addition, the Committee has successfully encouraged local, regional, and statewide school health conferences that are bringing together medical society members, educators, and public health personnel for discussions of school health problems.

As the Joint Committee nears the half-century point in its history, it can view its accomplishments with some perspective: In 1911, when the Committee was formed, a school physician was about as rare as the passenger pigeon, and a highly theoretical course in physiology was considered the apex in health education. Today, health has its proper place in the curriculum, is considered a prime administrative responsibility, and is an important factor in the design and maintenance of school facilities.

Chairman of the Joint Committee on Health Problems in Education is E. H. Pawsat, M.D., of Fond du Lac, Wis. A. M. A. representatives are Drs. Herman M. Jahr of Omaha; Jay J. Johns of Taylor, Texas; John F. Abele of Portland, Ore.; and Donald Dukelow of Chicago. NEA members are Austin Snyder, M.Ed., of Sayre, Pa.; Lloyd Michael, Ed.D., of Evanston, Ill.; Robert Yoho, H.S.D., of Indianapolis; Ruth Abernathy, Ph.D., of Los Angeles; and Sarah Louise Smith, Ed.D., of Tallahassee, Fla.

Clerics in Kokomo—Psychiatry and Religion Fight for Mental Health

If clergymen are adequately trained to counsel persons who have unhealthy patterns of living, many of the problems that appear can be alleviated before long-term medical-psychiatric care becomes necessary.

This was the motif last month when 23 clergymen from the Kokomo area in Indiana spent a week on the University of Chicago campus taking stock of the results of a six-month experiment in combining psychiatry and religion. Whatever may have been their original feelings, they now consider the plan a success and will continue and embellish it.

The project, financed by Lilly Endowment, Inc., of Indianapolis, is headed by the Rev. Granger

Westberg, D.D. He holds the nation's first joint professorship in theology and medicine at the University of Chicago. The plan's next six months will be studded with monthly four-hour clinical sessions held in Kokomo and headed by Dr. Westberg. In addition, he hopes to hold dinner meetings during the period with the Howard County Medical Society, Kokomo's lawyers, its educators, labor, and management.

The principle embodied in the Kokomo project—that trained clergymen can effectively combat mental illness because they work closely with people in a family setting—is not new. Many theological schools now include courses in their curricula based on the same principle (see *Medicine at Work*, THE JOURNAL, April 13, 1957). But Dr. Westberg sees no point in waiting for evolution to accomplish what may be done more quickly by another method. His interest is in the estimated 300,000 clergymen now holding pastorates for whom such theological innovations came too late.

Added to this, the Kokomo project has another big advantage: it deals not with the seminarian who will have to go forth and function on his own, but with the clerics of a single community who can return to their pastorates and function as a team in the fight for mental health.

Howard County's 23 ministerial pioneers have used the team concept from the very first. They spent a week on campus last June when the project was begun. They ate, lived, and studied together—with the help of the University's medical, psychiatric, and religious experts—during the period of indoctrination and returned to Kokomo with a new outlook. "This experience," one said, "has helped me feel that we clergymen are partners rather than competitors. For the first time, I really became acquainted with the other ministers."

The 23 returned to Chicago last month at the end of the six-month trial armed with a list of mental health problems noted within their congregations. These include the stresses of divorce and broken homes, the need for premarital counseling, day by day relations between doctors and clergymen, special problems of the aged, help for the alcoholic and his family, and pastoral counseling.

Although the original Kokomo group numbered only a little more than half of the town's clergy, the remaining 17 have asked Dr. Westberg to find a way that they may take part, too. He plans meetings with the second group on their home ground.

Although Dr. Westberg feels that the Kokomo project is a demonstrated success, he plans to match the program in a second community, this time in Illinois. If the success of both seem to be of equal importance, he hopes to expand the plan on a national basis.

Asked to characterize the Kokomo project, Dr. Westberg says, "I like to call it 'What to Do Until the Psychiatrist Comes.'"

Narcotics and the Law—Only One Of a Series of Medicolegal Problems

A Los Angeles physician in 1936 accepted a group of addicts for treatment—at the request of city officials who were closing a public clinic. After examination, the physician prescribed narcotic drugs for the patients and soon found himself a defendant in court.

The physician was acquitted, but not before three colleagues testified that his treatment was medically sound and two more testified it was not.

Such legal judgments indicate the need for a better understanding of the medical and legal aspects of narcotics addiction, and it is for just such increased understanding that a medicolegal symposium will be convened March 20 and 21 in Washington, D. C. The meeting will be the first in a series of three to be sponsored by the A. M. A. Law Department. Others will be held in Cleveland on April 3 and 4 and in Salt Lake City on April 17 and 18.

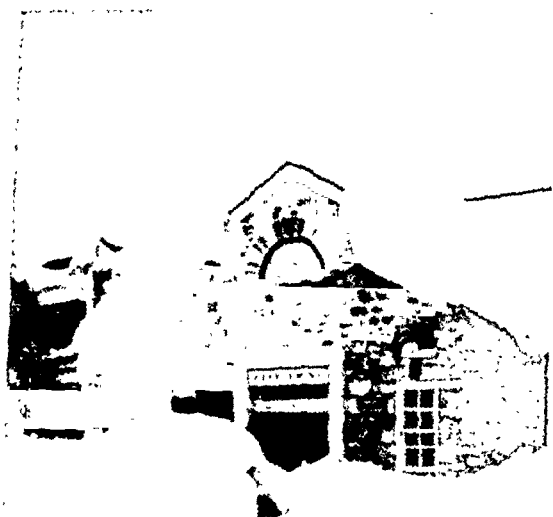
The programs for each will be similar and will include discussions on such other topics as traumatic neurosis, contingent fees, professional liability, impartial medical testimony, and cross examination of the expert medical witness. The groups will also view the third film in the A. M. A.'s medicolegal series, "The Man Who Didn't Walk," a study of traumatic neurosis.

Success of the past symposiums (an average audience of 300 divided almost evenly between physicians and attorneys) probably stemmed from the growing realization of the interconnection of the medical and legal disciplines. Dr. David B. Allman, former president of the A. M. A., dramatized this when he told the 1957 Philadelphia symposium:

"For many years I have had a slight acquaintanceship with the mutual problems of medicine and the law, but it was at the initial meeting in this series that I first realized the real importance of legal medicine and the absolute necessity for a closer and continuing liaison between physicians and attorneys."

MEDICINE AT WORK in future issues

- *When Medical Educators Meet*
- *Radiation—Double-Edged Sword*
- *Homemakers for Health*
- *Suicide—A Medical Problem*
- *Women in Medicine*
- *Hypnosis—Tool or Weapon*
- *Medical Research Heroes*



Three feet of snow buries autos at restaurant off Pennsylvania Turnpike where 800 motorists and passengers were stranded for nearly two days last March. Health problems inside were solved, with help of Air Force helicopter evacuation of serious cases, but one man died of heart attack while struggling through storm toward the shelter. (All photos from U. S. Air Force)

Snow Emergency!

Physicians as Leaders In the Midst of Storm

Milton Golín

Probable nor'-east to sou'-west winds, varying to the southard and westard and eastard and points between; high and low barometer, sweeping round from place to place; probable areas of rain, snow, hail and drought, succeeded or preceded by earthquakes with thunder and lightning.

When Mark Twain spoke those words 82 years ago he was caricaturizing New England weather. Yet, in the very exaggeration, his burlesque might also fit the current season's rampaging weather—not only in New England but in other areas of the U. S. For, to residents of many localities, this has been the severest winter in memory: Rain and ice-choked rivers flooding entire villages in Ohio and Pennsyl-

vania sheet and gale-force winds ripping a \$10 million property loss in upstate New York, snow and bitter cold isolating scores of communities in the Middle West. And ahead lies the spring which can melt the snow which can bring more catastrophe.

Each severe weather emergency spells a crisis or potential crisis in the lives of large masses of people. Each poses a public health problem of particularly intense personal concern—for water and warmth, for sanitation and shelter, for meals and medicines, for companionship and comfort. Probably no other public health situation surpasses a natural disaster in the degree to which private physicians, on short notice, have exerted action and leadership along with other medical personnel. Time and again, the individual practitioner in the face of community calamity has personified "medicine's finest hour." (See *Medicine at Work*, THE JOURNAL, Nov. 24, 1956 and Aug. 10, 1957.)

But while tornado, flood, hurricane, fire, train-wreck, and earthquake are almost invariably obvious in their sudden villainy, the peril of snow so often is not obvious, not sudden, and not immediately recognized as a villain.

It can appear joyful.

It can look tender and pure.

It can wear a lovely face.

Joyful?

Just a couple of weeks before last Christmas, Dr. James F. Grant strolls out of what seems to be a light and jolly snowfall and into the city hospital of a mid-state New York community of 23,000. That evening he peers out of a hospital window. The snow has piled up to four feet! This is Oswego, scene of one of the most paralyzing snows ever to strike a U. S. community. It keeps snowing—to the five-foot mark, then to five and a half feet. It stops for a while. (At last report, Oswego's snowfall for this season was more than 150 inches, including a "mild" 10 inches one week end last month.)

As Oswego City Hospital becomes the emergency center for all medical activities, 10 of the 18 staff physicians work day and night without sleep—functioning under a prearranged civil defense plan that has patients abed in the cafeteria and state police cars and snow-plows doubling as ambulances. "No use going home," says Dr. Grant, a pediatrician who serves as city health officer. "I tried, and gave up after it took 90 minutes to move less than half a mile."

Two obstetricians of Oswego, Drs. William F. Quigley and John S. Puzauskas, are wise enough to transport their patients to the hospital before the snow is too high. But one emergency maternity patient must be brought in by a police official who is forced to back up his car 10 miles along a single-lane snow-walled path. A few of the sick cannot be reached immediately because doctors are

caught in stalled autos. But, under medical direction, civil defense volunteers deliver drugs and supplies, and soon they are making door-to-door calls to ascertain medical needs in neighborhoods where power and phone lines are down.

Transportation comes to a virtual halt, and so nurses use skis and snowshoes to reach the city hospital. One registered nurse, Mrs. Areta Ware, makes her way 30 miles in the storm to report for duty. "Snowstorm casualties are surprisingly light," reports Dr. Grant. "Our medical civil defense plan deserves a lot of credit for that."

One patient at city hospital during the height of the storm is a Mr. Snow. He reacts good-naturedly when joshed about getting a bill for doubled room rates. . . .

Tender and Pure?

It is Easter vacation from classes for scores of college students less than a year ago as they ride toward home, in autos and buses, along the Pennsylvania turnpike. The snow is falling, soft and clean. Also on the turnpike near Morgantown, Pa., that March 19 are more than 100 truck drivers, four ministers, three nuns, 20 members of a "rock and roll" troupe, a dozen servicemen, 40 young children, two ambulance drivers, three nurses, three doctors.

All of them and more—a total of 800 persons—suddenly find themselves stranded in the tender and pure snow. Envisioning a fight for survival, they abandon their vehicles and head for the same place—a restaurant which normally handles only 200 customers for brief periods.

In the group is a 33-year-old obstetrician from nearby Columbia, Pa., Dr. Robert M. Lombard. He is worrying about incubation of disease under such crowded conditions, planning a rescue effort for an ambulance patient, mulling over the details of establish-

Observers of Crises

How do masses of people behave when they are engulfed in sudden calamity? How can lessons learned from one disaster help a different set of individuals to weather another catastrophe a thousand miles away? Exploring human behavior during a community crisis is the chief mission of a little-heralded group—the Disaster Research Group (formerly the Committee on Disaster Studies) of the National Academy of Sciences—National Research Council. It collaborates with anthropologists, psychologists, sociologists, and other scientists in interviewing victims of severe snowstorms, tornadoes, explosions, and floods. So far, the Disaster Research Group has published ten reports and a number of journal articles. Members have found that some of the most serious obstacles to survival are faulty communications systems. And, they add, two leading factors in the wake of disaster have been the degree of preparedness and of organized leadership. As one of the group pointed out, "Somebody has to be in charge if the mayor is out of town on the day of disaster."

ing a first-aid station. Those thoughts are interrupted by shouting voices: "That's my hamburger." "No, it's mine." Dr. Lombard sees men, women, and teen-agers scrambling for food—people tired, hungry, and discouraged. He sees the need for a bold move to reduce this mounting tension.

So Dr. Lombard leaps onto a restaurant counter and introduces himself. Everyone turns and stops talking at once. It is so quiet you can hear the snow falling. He says: "We need some organization here if we are to wait this out in good health. Are there volunteers to help?" By actual count, more than 700 of the shelterees offer



Left, helicopter view of trucks, autos and buses abandoned on Pennsylvania Turnpike during heavy snowfall last March. Right, administering penicillin injection at makeshift medical center set up in restaurant for one of 800 persons thrown together there for up to 36 hours. Place normally serves no more than 200 customers for brief periods.

a variety of services. Moments later, as Dr. Lombard shares supervisory roles with two Air Force majors and two sales managers, there is order—and the tension gradually eases. What is the situation?

An auxiliary power generator is providing basic needs for heat, light, and cooking. Five telephone lines remain open. The first-aid center is set up for exposure victims, two diabetic patients, a child with croup, and a woman in shock. Well-designed toilet facilities meet sanitation needs. A man dies of a heart attack while struggling in the snow toward the restaurant; his body is wrapped in blankets and kept outside until flown out by helicopter the next day. Meanwhile, the nuns comfort his widow. Doors and windows are thrown open every half hour, at the direction of Dr. Lombard, in order to ventilate the building. Sandwiches are delivered to a busload of riders who have not evacuated to the restaurant. In anticipation of possible drunken behavior, a public plea is sounded to donate liquor for medicinal purposes; five bottles are contributed to the dispensary as a result.

Finally, after 36 hours, the turnpike is cleared of snow and evacuation takes place. Dr. Lombard leaves with the others. . . .

Lovely?

It is just a few weeks ago—Jan. 14, 1959. Dr. Walter H. Roehll, a general practitioner from Middletown, Ohio, and member of the Middletown hospital disaster committee, is counting the hours in terms of years as his airliner circles Chicago to await landing in severe wintry weather. Exactly seven hours up is the plane—exactly seven years back go the recollections of Dr. Roehll.

He remembers the lovely snow peaks of the California Sierras that Jan. 14, 1952, when a streamliner train carrying himself and 225 other persons is stuck at Yuba Gap in this century's worst blizzard of the California high country. The recall of those 72 hours of danger and terror is vivid: Fresh water gone and lights going, plumbing frozen, food dwindling, morale dropping, heat vanishing, and above the train an incipient avalanche. A narcotics addict on board, suffering withdrawal symptoms, seems to be going mad. Worst of all, scores of passengers are knocked out by carbon monoxide fumes from the exhaust of an unvented generator.

Dr. Roehll, accepting leadership responsibilities, rations his meager supply of drugs to nip upper respiratory infections and to relieve the narcotics addict temporarily. (Gin from the club car is used for skin and syringe sterilization.) A half-dozen nurses among the passengers are his emergency staff. Without sleep hour after hour, fighting off unconsciousness, Dr. Roehll manages to make his rounds from car to car—reassuring frightened mothers and whimpering children.

Finally, rescue comes. Later, Dr. Roehll writes: "The fact that severe disaster did not occur is in no way due to any heroic or unusual practice but, rather, due to the fact that rescue operations were successfully carried out as quickly as possible. The physician must

maintain a high sense of faith in his fellow man and require him to do only the possible and, by his actions and manners instill confidence in ultimate rescue and relief. . . . In a disaster—potential or real—the key word is conservation—conservation of water, of worry, of all the physical, mental, and spiritual stock."

For his "untiring zeal beyond the call of duty" Dr. Roehll is honored in resolutions adopted by the Ohio State Medical Association and the A. M. A. House of Delegates. . . .

Officially, Spring is one month away. But for many parts of the nation, the snow and cold of winter have more than four weeks to run. Does this season still hold the peril of a snowbound city? Of a snowstorm emergency for hundreds of people along some turnpike? Of a train trapped in some blizzard mountain pass?

If it does, there is strong likelihood that a hospital disaster plan, a county medical society civil defense blueprint, an individual physician's ingenuity will be there to help break the snow barrier which threatens human life. For throughout the medical community there now is realization of poetry perhaps, but not always truth, in John Whittaker Watson's verse:

O the snow, the beautiful snow,
Filling the sky and the earth below.
Over the housetops, over the street,
Over the heads of the people you meet.
Dancing,
Flirting,
Skimming along,
Beautiful snow, it can do nothing wrong.

Renaming an A. M. A. Committee

Meeting a snow emergency is not too different from meeting an enemy attack, insofar as medical preparedness is concerned. Readiness through plan and practice is the key. The A. M. A.'s latest nationwide survey of county medical society activities shows that more than half of the approximately 2,000 societies have committees devoted to civil or disaster defense. But in its continuing effort to emphasize that preparedness for natural disaster automatically equips physicians for war disaster, the A. M. A. Committee on Civil Defense has been confronted with a problem of semantics: Too many people still were thinking only of armed conflict whenever they heard the phrase "civil defense." So this month, under authority of the Board of Trustees, the four-year-old Committee headed by Dr. Harold Lueth of Evanston has a new name—Committee on Disaster Medical Care. It will continue to function under the A. M. A. Council on National Defense.

THE JOURNAL

OF THE AMERICAN MEDICAL ASSOCIATION



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Subscription price . Fifteen dollars per annum in advance

Cable Address "Medic, Chicago"

THE NEPHROTIC SYNDROME

ACCORDING to Kark and co-workers¹ "the metabolic, nutritional and clinical consequences of continued massive albuminuria constitute the nephrotic syndrome." Far from being a single entity, as once thought, it can be produced by a variety of causes which may be grouped as (1) heredofamilial diseases, (2) infections, (3) toxins, (4) allergens, (5) mechanical disturbances, (6) generalized diseases, and (7) intrinsic renal diseases. Pathologically the characteristic lesion is necrosis of the tubules. Clinically the disease is characterized by oliguria, edema, and anorexia, although in many persons it may exist in a subclinical form and be discovered only by a routine urinalysis. In microscopic section the glomeruli may appear to be ischemic, but no change in their structure is seen with the ordinary microscope.² Folli and co-workers³ studied renal biopsy specimens from patients with the nephrotic syndrome by means of an electron microscope. When their first specimen was taken the patient had marked edema and they were able to demonstrate glomerular swelling. The most striking changes were in the epithelial cells whose pedicels had disappeared and were replaced by a continuous

layer of epithelial cytoplasm of irregular thickness. After treatment with prednisone only minimal abnormalities were seen in the epithelial cells. A third biopsy specimen, taken after recovery was complete, revealed normal glomerular epithelium.

Although albuminuria is always found in nephrotic patients, albumin makes up only about 70% of the protein lost by these patients through the urine. Due to loss of complement these patients are more susceptible to infection and due to loss of iron-binding proteins they may develop anemia. Renal function tests invariably show evidence of renal impairment.

Because the nephrotic syndrome may arise from so many widely differing causes, no routine treatment can be recommended. Treatment should be directed first of all toward removing the cause, if possible. Above all it must not be assumed that nothing can be done for the patient. Many run a benign course. Restricting the intake of sodium chloride to less than 580 mg. a day will prevent edema, and in the edematous patient this alone will usually initiate diuresis. This can now be readily accomplished by the use of a specially prepared milk powder. Fear that a high protein diet will overwork the kidneys is no longer tenable and, because of the protein loss through the urine, every effort must be made to replace the loss. This is made difficult by the patient's anorexia, but if coaxing and firm encouragement to not overcome this obstacle nasal tube feeding is preferred to intravenous infusions. Supplemental potassium may be required in the early stages. The value of steroid therapy is still undetermined. Although many observers have reported that this treatment reduces edema, the relapse rate when treatment is discontinued is high. In the very severe cases it may be necessary to use the artificial kidney for a short period. Through such measures many patients formerly given up as incurable are being saved.

CHANGE OF ADDRESS

If you change your address please notify THE JOURNAL at least six weeks before the change is made. Include the address label clipped from your latest copy of THE JOURNAL, being sure to clearly state both your old and new address. If your city has Postal Zone Numbers, be sure to include this Zone Number in your new address.

1. Kark, R. M., and others: Nephrotic Syndrome in Adults: Common Disorder with Many Causes, *Ann. Int. Med.* 49:751-774 (Oct.) 1958.

2. Hodges, J. H.: Lower Nephron Syndrome, *J. M. Soc. New Jersey* 54:11-15 (Jan.) 1957.

3. Folli, G., and others: Electronmicroscopic Studies of Reversible Glomerular Lesions in Adult Nephrotic Syndrome, *Ann. Int. Med.* 49:775-795 (Oct.) 1958.

ORGANIZATION SECTION

NATIONAL CONFERENCE ON RURAL HEALTH

The Council on Rural Health of the American Medical Association will hold its 14th National Conference on Rural Health, March 5-7, at the Broadview Hotel, Wichita, Kan. The sessions will be attended by physicians, representatives of farm organizations and governmental agencies, and others interested in the problems of rural health. The program follows:

THURSDAY MORNING, MARCH 5

CARL L. S. MUNDY, M.D., *Presiding*

- 8:00 Registration
No registration fee
- 9:45 Opening Service
Community Singing
LESTER F. WEATHERMAN
Farm Director, Radio Station KFBI, Wichita, Kan.
- 10:00 Invocation
DR. HOMER K. SCHAFER
Executive Director, Wichita Council of Churches,
Wichita, Kan.
- 10:05 Greetings
THE HONORABLE GEORGE DOCKING
Governor of the State of Kansas, Topeka, Kan.
- 10:10 Horizons in Rural Health
F. S. CROCKETT, M.D., Chairman
Council on Rural Health, American Medical Association, Lafayette, Ind.
- 10:25 To the Stars Through Difficulties
LOUIS M. ORR, M.D., President-elect
American Medical Association, Orlando, Fla.
- 10:45 The Do It "Yourself" Age
EARL L. BUTZ, Ph.D.
Dean of Agriculture and Director, Agricultural
Extension Service, Purdue University, Lafayette,
Ind.
- DISCUSSION LEADER
J. P. SCHMIDT, Ph.D.
Extension Professor, Agricultural Extension Service,
Ohio State University, Columbus, Ohio
- 11:40 Luncheon Period

THURSDAY AFTERNOON

ALLEN T. STEWART, M.D., *Presiding*

- 2:00 Community Singing
- 2:05 Experiment in Community Health Participation
Moderator: V. E. WILSON, M.D.
Assistant Dean, University of Kansas, School of
Medicine, Kansas City, Kan.
- 3:30 Milk Break
- 3:40 Workshop (Continued)
- 4:15 Discussion

THURSDAY EVENING

CARROLL B. ANDREWS, M.D., *Presiding*

- 8:00 Recreational Program
Youth's Showcase
Presentation by Agricultural Extension Service,
Kansas State Agricultural College, Manhattan,
Kan.

Our Community's Answer

Spirit of Kansas

A vocal and instrumental presentation

FRIDAY MORNING, MARCH 6

W. A. WRIGHT, M.D., *Presiding*

- 9:00 Community Singing
- 9:05 Rural Health Count-Down
J. D. SMERCHEK
Kansas Farm Bureau, Manhattan, Kan.
- 9:30 Grange Thinking on the Rural Health Front
ROY BATTLES
Assistant to the Master, The National Grange,
Washington, D. C.
- 9:35 Who Will Harvest My Wheat
AUBREY D. GATES, Director, Division of Field
Services, American Medical Association, Chicago
- 9:50 Discussion
- 10:10 Milk Break
- 10:20 Family Physician and the Cost of Medical Care
CONRAD BARNES, M.D.
Seneca, Kan.
- 10:35 The Best Buy in Insurance
CHARLES H. COGHLAN
Executive Vice-president, Ohio Medical Indemnity, Inc., Columbus, Ohio
- 10:50 The Hospital Dollar
JOHN POND
Management Consultant to the Larimer County
Hospital, Boulder, Colo.
- 11:10 Discussion
- 11:45 Luncheon Period

FRIDAY AFTERNOON

F. A. HUMPHREY, M.D., *Presiding*

- 2:00 Community Singing
- 2:05 How Hospitals Get People Well
C. R. BROTT, M.D.
Beatrice, Neb.
- 2:20 Mental Health as a Part of General Practice
ALONZO P. PEEKE, M.D.
Volga, S. D.
- 2:35 The New Era of Aging
FREDERICK C. SWARTZ, M.D.
Chairman, Committee on Aging, American Medical Association, Lansing, Mich.
- 2:50 Discussion
- 3:15 Milk Break
- 3:25 Horizons in Mental Health
PRESCOTT W. THOMPSON, M.D.
Director, Out-Patient Service, The Menninger
Clinic, Topeka, Kan.
- 4:00 Discussion

FRIDAY EVENING

F. S. CROCKETT, M.D., *Presiding*

- 7:00 Banquet
Invocation
THE REVEREND DONALD FROGGE
Pastor, Upland—Alida Parish, Junction City, Kan.
- INTRODUCTION OF SPECIAL GUESTS
- Greetings
Woman's Auxiliary, American Medical Association
MRS. E. ARTHUR UNDERWOOD, President
Vancouver, Wash.

Student American Medical Association
 WILLIAM KIRKHAM, Treasurer
 Oklahoma City

MUSICAL INTERLUDE
 The Fifth Dimension

T. P. BUTCHER, M.D., President
 Kansas Medical Society, Emporia, Kan.

SATURDAY MORNING, MARCH 7

NORMAN H. GARDNER, M.D., Presiding

9:00 Community Singing

9:05 This We Know

Mrs. E. ARTHUR UNDERWOOD, D.D.S.
 President, Woman's Auxiliary, American Medical
 Association, Vancouver, Wash.

9:25 Progress in the Control of Some Diseases of Animals
 Affecting the Rural Health

MARTIN P. HINES, D.V.M.
 American Veterinary Medical Association, Ra-
 leigh, N. C.

9:45 Discussion

10:10 With Your Apron On or Off

MRS. KENNETH D. SCHNEIDER
 Nashville, Ind.

10:25 Discussion

10:35 Recess

10:45 Ideas Pay Off in Action

PAUL C. JOHNSON
 Editor, *Prairie Farmer*, Chicago

11:05 Discussion

11:15 Rural Health—Past, Present, and Future

FRANKLIN P. MURPHY, M.D.
 Chancellor, University of Kansas, Lawrence, Kan.

DR. YODER JOINS HEADQUARTERS STAFF

Dr. Franklin C. Yoder of Cheyenne, Wyo., was appointed director of the Division of Socioeconomic Activities effective Jan. 1. He received his M.D. degree from the University of California and was

in private practice from 1940 to 1947, when he became director of the Wyoming Department of Public Health, a position he has held until assuming his present duties. He was the secretary-treasurer of the Association of State and Territorial Health Officers, 1954-1956, and is the immediate past-president of that organization. He is a member of the Health Resources Advisory Committee, Office of Civil and Defense Mobilization, a commissioner of the Western Interstate Commission on Higher Education, and editor of the Wyoming section of the *Rocky Mountain Medical Journal*. In 1957 he was a member of the U. S. Delegation to the World Health Organization and of the Virus Research and Epidemiology Committee of the National Foundation for Infantile Paralysis. He is a diplomate of the American Board of Preventive Medicine. The following department heads will be under his administrative direction: Director, Bureau of Health Education; Director, Economic Research Department; Secretary, Council on Industrial Health; Secretary, Council on National Defense; Secretary, Council on Medical Service; Secretary, Council on Rural Health; and medical representatives, Washington, D. C.

NEW INDUSTRIAL HEALTH PAMPHLET

The Council on Industrial Health now has a new pamphlet entitled "Guide for Medical Services for Construction Projects." Single copies will be sent free on request, and prices on multiple copies will be furnished on request.

CORRESPONDENCE

SMALLPOX VACCINATION

To the Editor:—Here in Baltimore we heartily agree with your editorial, "Immune or 'No Take' Reaction in Smallpox Vaccination" (*J. A. M. A.* 168:1900 [Dec. 6] 1958). Under the state of Maryland compulsory vaccination law, no child is allowed to attend public school without evidence of a successful vaccination against smallpox. The teachers and school nurses are instructed not to accept certificates with "immune reaction" or "no take" written on them. All such children are referred back to their family physicians or to the health department for revaccination. During 1957, 63 children were referred to the health department; of these, 34 gave primary reactions and 14 vaccinoïd reactions on revaccination.

The importance of keeping the vaccine on ice during storage is dramatically impressed on all medical students attending both the Johns Hopkins and the University of Maryland schools of medicine in an annual lecture by Dr. Huntington Williams,

the commissioner of health of Baltimore. During the entire lecture on smallpox vaccination, the vaccine is placed on a 200-lb. cake of ice which sits on the table between Dr. Williams and the class. The fact that former students of over 20 years ago still remember this lecture with its cake of ice bears testimony to its effectiveness as a teaching method.

ROBERT E. FARBER, M.D.
 Baltimore City Health Department
 Baltimore, Md.

To the Editor:—With regard to THE JOURNAL editorial, "Immune or 'No Take' Reaction in Smallpox Vaccination," attention is invited to my note in *GP* (5:50 [June] 1952) which sets forth the basic facts of reading smallpox reactions. This is the system that was taught at the U. S. Army Medical Field Service School. Smallpox vaccinations should be seen two or three days after vaccination, for the "immune reaction" disappears by the end of the week. Several "negative" revaccinations noted at the

end of the week and absence of an "immune reaction" on the second or third day may indicate that a worthless vaccine has been used. It should again be emphasized that every vaccination made with a potent vaccine will take, but, as the editorial in *THE JOURNAL* states, unless the site is examined on the third and seventh days the "immune reaction" will be missed.

EDWIN MATLIN, M.D.
27 Baltimore St.
Mt. Holly Springs Pa.

Dr. Matlin's letter was referred to the U. S. Army Surgeon General's Office, and Col. Arthur P. Long, Chief of the Preventive Medicine Division, replied as follows:

To the Editor:—Dr. Matlin's note published in *GP* is essentially in accord with smallpox vaccination practice as outlined in TB Med 144 and as currently presented at the Army Medical Service School. Throughout the publication the Army stresses the fact that no vaccination should be considered to be completed until it has been interpreted and the type of reaction recorded on the immunization recorded. Medical officers are instructed as to the importance of reading vaccinations two or three days after they are administered and at the end of one week if no reaction is observed at the first reading. The fact is stressed that the patient's word as to the presence of a reaction is not acceptable as evidence of a "take."

Col. ARTHUR P. LONG (MC)
Office of the Surgeon General
Washington 25, D. C.

COUNCIL ON DRUGS

To the Editor:—I wholeheartedly agree with the comment by Dr. S. P. Leinbach (*J. A. M. A.* 169:69 [Jan. 3.] 1959) regarding the excellent help available to practicing physicians, if they will only take advantage of it. The A. M. A. Council on Drugs is one of the best sources of sound information that physicians can get on the tremendous number of new drugs that are now being offered by fast-talking detailmen and flamboyant advertisements from even the best pharmaceutical companies. Good medicine cannot be practiced if physicians do not give careful attention to the choice of the drugs they use. New drugs are carefully scrutinized by the Council on Drugs. Reports are made frequently in *THE JOURNAL* and are included for description in *New and Nonofficial Drugs*. New drugs are so well appraised by the Council on Drugs and the reports are so well made on them that *New and Nonofficial Drugs* is one of the best current books available on modern pharmacology.

Certain essential facts and information which physicians must have about every drug in order to use it wisely are what it is and what its chem-

ical relatives are; how quickly it is absorbed, metabolized, and removed from the body; what the safety range is between the dosage that is required to give the effect desired and the dosage that may cause some untoward effects; what the drug actually does to the cells, tissues, and organs of the body; and what the indications are for its effective use. This information is given by the Council on Drugs. This is the sort of information that physicians should insist that detailmen be prepared to give them and that advertisements should contain. Surely advertisements with this sort of information would be more appropriate to the dignity of the medical profession than are some of those which now flood medical journals. Physicians should strongly support the work of the Council on Drugs. More important, it will be to the practical advantage of physicians to follow the advice and service rendered by the Council.

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Columbus 10.

LOWERING BLOOD LIPID LEVELS

To the Editor:—The excellent article "Lowering Blood Lipid Levels by Changing Food Patterns," which appeared in *THE JOURNAL* (168:1989-1995 [Dec. 13] 1958), is one of the first practical articles dealing with the use of vegetable oils as replacement of solid fat in the diet to decrease the serum cholesterol level. The authors are to be complimented for their reasonable approach to a complex dietary problem and for again confirming the cholesterol-depressing effect found by earlier investigators. There are some statistical errors in the article in connection with the availability of certain oils. The article states that a bushel of corn produces only 0.75 lb. of oil. Practical corn oil refinery operations yield about 2 lb. of oil per bushel of corn. The actual amount of oil present in the grain itself is about 4% of the total weight. The impression that corn oil is not readily available should be corrected. The salad and cooking oil market of the United States approximates 300,000,000 lb. of product annually sold through retail grocery outlets. Of this, corn oil accounts for more than 33%. Much larger amounts of corn oil can be made available when needed. Mazola Pure Corn Oil, produced by Corn Products Company, is available in practically every grocery store in this country at prices competitive with those of other domestic oils. Many of the investigators working in the field of serum cholesterol depression used corn oil in their studies, and often it was considered the standard reference oil for evaluation.

ROBERT G. RUARK
Corn Products Company
17 Battery Pl.
New York 4.

MEDICAL NEWS

ARKANSAS

Institute in Psychiatry and Neurology.—The Veterans Administration Hospital, North Little Rock, will hold its 11th annual Institute in Psychiatry and Neurology, Feb. 26-27. Out-of-state participants will include the following:

Dr. Kenneth E. Appel, Ardmore, Pa.; Dr. Leo H. Bartemeier, Baltimore; Mr. Clark W. Blackburn, New York City; Dr. J. B. Bounds, Roanoke, Va.; Dr. Dexter Bullark, Rockville, Md.; Dr. Francis J. Certy, Chicago; Dr. J. McV. Hunt, Urbana, Ill.; Dr. Bernard I. Kahn, San Francisco; Dr. Edith M. Lentz, Minneapolis; Dr. S. J. Muirhead, Salisbury, N. C.; Dr. G. Wilse Robinson Jr., Kansas City, Mo.; Dr. Mathew Ross, Washington, D. C.; Dr. R. T. Westman, St. Louis; and Dr. Stewart G. Wolf, Oklahoma City, Okla.

The annual dinner the evening of Feb. 26 will be co-sponsored by the Arkansas Psychiatric Society, Arkansas Association for Mental Health, Arkansas Psychological Association, and North Little Rock VA Hospital. Dinner speakers will include Dr. L. A. McDaniel, past-president of the Arkansas Medical Society, Tyronza, and Dr. Bartemeier. For information write Dr. H. W. Sterling, Manager, Veterans Administration Hospital, North Little Rock, Ark.

CALIFORNIA

Symposium on Enzymes.—A three-day program on "Basic and Clinical Aspects of Enzymes" will be given April 2-4 at the University of California Medical Center, San Francisco. A staff of more than 20 specialists will take part in the symposium. Guest speakers include Dr. Oscar Bodansky, New York City; Dr. Roscoe O. Brady, Bethesda, Md.; David E. Green, Ph.D., Madison, Wis.; Hans F. Jensen, Ph.D., Fort Knox, Ky.; Juda H. Quastel, Ph.D., Montreal; Sidney Weinhouse, Ph.D., Philadelphia. For information and application write Dr. Seymour M. Farber, Department of Continuing Medical Education, University of California Medical Center, San Francisco 22.

Dedicate Biophysics Laboratory.—Dedication ceremonies for Stanford University's new \$124,000 Biophysics Laboratory were held Jan. 10. Detlev W. Bronk, LL.D., president, Rockefeller Institute for Medical Research and the National Academy of Sciences, was the speaker, and Stanford president Wallace Sterling and other university officials

were hosts for the day-long dedication ceremonies. A scientific session was held in the morning, followed in the afternoon by a tour of the new facilities and Dr. Bronk's address. Dr. Henry S. Kaplan, who heads the new laboratory, was in charge of the program. The new Stanford Biophysics Laboratory houses studies on x-ray microscope development, radiation physics, experimental electron therapy of cancer, cell physiology, and the biological role of free radicals. The laboratory also will provide temporary research space for Joshua Lederberg, Ph.D., co-winner of the 1958 Nobel Prize in medicine. He will head a new department of genetics in the Medical School.

DISTRICT OF COLUMBIA

Annual Lecture.—The Psi Chapter of the Phi Delta Epsilon Fraternity will hold the Aaron Brown Lectureship April 4 in The George Washington University School of Medicine, Hall A, Washington, D. C. The guest speaker will be Dr. Waldo E. Nelson, professor of pediatrics, Temple University School of Medicine, and medical director St. Christopher's Hospital for Children, Philadelphia. His subject is "Antenatal Origin of Disease."

University News.—Dr. Desmond S. O'Doherty, associate professor of neurology in the Georgetown University School of Medicine, has taken over the duties of Dr. Francis M. Forster in the direction of the department of neurology. Dr. Forster, chairman of the department and former dean of the Medical School, has resigned to accept a position as director of the department of neurology at the University of Wisconsin, Madison. A native of Ireland, Dr. O'Doherty joined the Georgetown faculty in 1951.

Dr. Copeland Named Chairman of Cancer Committee.—Dr. Murray M. Copeland, director, department of oncology, Georgetown University School of Medicine, was recently elected chairman of the Joint Committee for Cancer Staging and End Results Reporting. This group, whose purpose is to formulate a program of cancer staging and end results reporting for the American medical profession, is composed of members and alternates designated by the American College of Physicians, the American College of Surgeons, the American College of Radiology, the College of American Pathologists, the American Cancer Society, and the National Cancer Institute.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

GEORGIA

Seminar of Pathologists in Atlanta.—The third annual seminar of the Atlanta Society of Pathologists will be held April 11-12 in Atlanta. Various workshops will be held April 11 and a seminar and panel discussion on neuropathology will be given April 12. Dr. James W. Kernohan will serve as moderator for the morning seminar, and Drs. John E. Whiteleather, William H. Sweet, and Kernohan will participate in the afternoon panel discussion. For information write Dr. John T. Godwin, 265 Ivy St., N. E., Atlanta 3, Ga.

HAWAII

Golden Jubilee of Children's Hospital.—The Honolulu Pediatric Society is sponsoring the Golden Jubilee Celebration of Kapiolani Children's Hospital April 19-22, in Honolulu. Guest participants for the scientific program will be Drs. James R. Gallagher, chief, Adolescent Unit, Children's Medical Center, Boston, and Tague C. Chisholm, assistant clinical professor of surgery, University of Minnesota, Minneapolis. Topics will be centered on problems of adolescent and pediatric surgery. Reservations may be made with the Golden Jubilee Committee, Children's Hospital, Honolulu, T. H., or directly through the American Academy of Pediatrics, % Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill. Princess Kaiulani Hotel Meeting House will be the center for the scientific sessions.

ILLINOIS

Hospital Lecture.—The sixth lecture in the ninth annual North Shore Hospital Lecture Series on "Emotional Forces in the Family" will be held at the hospital, 225 Sheridan Road in Winnetka, March 4, 8:00 p. m. "The Impact of Aging in the Family" will be discussed by Dr. Donald G. McKerracher, professor of psychiatry, University of Saskatchewan. The Commission on Education of the American Academy of General Practice has approved these lectures for category II credit. Dr. McKerracher has agreed to answer questions after his presentation. All physicians and allied professional personnel are cordially invited.

Chicago

Dr. Lull to Lecture.—Dr. George F. Lull, who resigned recently as assistant to the president of the American Medical Association, will present the sixth of a series of lectures on the history of surgery and related sciences Feb. 24, 8 p. m., at the International Surgeons Hall of Fame, 1524 Lake Shore Drive. Dr. Lull's subject will be "Notes About the Role of Physicians in Our Military History." The lecture is open to physicians, medical personnel and students, and to the public. There

is no admission charge, but accommodations are limited to 300. For reservations write Dr. Ross T. McIntire, Executive Director, International College of Surgeons, 1516 Lake Shore Drive, Chicago 10.

Public Schools Need Physicians.—The Board of Education of the City of Chicago needs a full-time medical officer and 4 part-time medical officers, one of whom is a psychiatrist. The medical activities include the operation of a comprehensive school health program involving 100 teacher-nurses and screening procedures with respect to hearing, vision, cardiac abnormalities, and other phases of health services to children. Among other things this staff conducts the physical examination of employees when they are first employed and special examinations from time to time of other employees. Applications should be sent to the General Superintendent of Schools, 228 N. LaSalle St. Salaries for part-time medical personnel range from \$600 to \$900 per month; full-time medical personnel, from \$12,000 to \$17,000 per year.

Establish Professorships in Nutrition and Metabolism.—Two professorships in nutrition and metabolism, reportedly the first to be endowed specifically in this field in a medical school, have been established at the Northwestern University medical school. Each chair is endowed for a half million dollars, made possible through the efforts of the Spies Committee for Clinical Research, made up of educators, industrialists, and scientists dedicated to support the work in nutrition begun to Dr. Tom D. Spies, chairman, department of nutrition and metabolism at Northwestern Medical School, and scientific director, Nutrition Clinic, Hillman Hospital, Birmingham, Ala. The university named the first chair the Tom D. Spies Professor of Nutrition and Metabolism. It will be awarded to Dr. Robert E. Stone, professor of nutrition and metabolism at Northwestern. The second professorship, as yet unnamed, will be held by Dr. Spies.

Establish Unit on Nuclear Medicine.—Dr. Lowell T. Coggeshall, dean of the University of Chicago Division of Biological Sciences, announced the establishment of the Section on Nuclear Medicine in the School of Medicine. He said it will deal with the full range of atomic public health problems from atmosphere to zoology. The Rockefeller Foundation approved support for the new unit of up to \$500,000 and the university and other sources will provide additional funds. The types of problems the new section will explore are (1) the increase in natural background radiation due to by-products of all current uses of nuclear energy devices; (2) the actual or probable consequences—genetic and physiologic—of the increased exposure

of man and domestic animals to ionizing radiation; (3) legislative controls of factors responsible for increased exposure to radiation; (4) medico-legal aspects of personal injury and compensation of personnel engaged in the nuclear energy industry; and (5) the psychological reactions of society to the threatening aspects of nuclear energy.

MASSACHUSETTS

Hospital Seminar in Holyoke.—Dr. Franz J. Ingelfinger, of Boston University School of Medicine, and Dr. Charles S. Welch, of Albany Medical College, will present the semi-annual Providence Hospital seminar in Holyoke March 4. Their subject is medical and surgical aspects of gastroenterology. For information write Dr. Richard J. Maher, 197 Chestnut St., Holyoke, Mass.

MARYLAND

Conference on Television in Medical Education.—"The Future of Television in Postgraduate Medical Education" will be the subject of a conference to be held Feb. 28–March 1 at the Clinical Center, National Institutes of Health, Bethesda. The conference will be held under the auspices of the Institute for Advancement of Medical Communication, with the American Academy of General Practice acting as co-sponsor. Participants will include experts in the field of medical television and those charged by professional organizations with responsibility for planning and conducting television programs designed for postgraduate medical audiences. Attendance is by invitation. For information write Dr. Richard H. Orr, Executive Director, Institute for Advancement of Medical Communication, 33 E. 68th St., New York 21.

MICHIGAN

Fellowship in Public Health.—A \$2,500 graduate fellowship in public health is being offered by the Michigan Tuberculosis Association. The Werle-Bennett Graduate Fellowship is open to residents of Michigan with a bachelor's degree from a recognized college or university. Applicants must be qualified for admission to the University of Michigan School of Public Health but may study at any public health school. Applications should be made by April 1. Information and application blanks may be gotten from the Michigan Tuberculosis Association, 403 Seymour Ave., Lansing, Mich. The grant was set up "to encourage people to enter the tuberculosis and public health fields and to encourage graduate study." Recipients of the fellowship will be expected to work in Michigan for a voluntary tuberculosis association or in public health for two years following graduation. The fellowship was named in honor of Theodore J. Werle, executive secretary of the Michigan Tuberculosis Association for 35 years, and Harry D. Bennett, who has

served since 1922 as treasurer of the association. Christmas Seal contributions finance the fellowship.

Mexican Students Attend University Seminar.—Fifteen senior medical students from the National University of Mexico arrived in Ann Arbor Jan. 30 for a month-long seminar at The University of Michigan Medical Center. Arranged by the two Universities through the U. S. Department of State, the seminar reportedly is expected to open greater professional exchanges within the Americas. The Mexican students began regular classes Feb. 2. Visiting students, paired with a senior in the U-M Medical School, attend regular classroom activities and clinical sessions. The 15 are divided according to special fields of interest, including medicine, surgery, obstetrics, radiology, pediatrics, and psychiatry. Medical coordinator of the seminar is Dr. Sibley W. Hoobler, of the department of internal medicine, who previously had flown to Mexico City to select the 15 visitors from 30 candidates chosen by the faculty of the National University. Chosen on the basis of grades, personality, and potential for future leadership in medicine, the group represents the top 5% of the senior class at the University of Mexico Medical School, reportedly the oldest medical school in the Americas. Following their month-long experience at the University of Michigan, the visitors will make a two-week tour of the northeastern U. S. to Cleveland, Ohio (March 1), Buffalo and Albany, New York (March 2-3), Boston, Mass. (March 4-6), New York City (March 6-9) and Washington, D. C. (March 9-15).

MISSISSIPPI

Symposium on Psychosomatic Obstetrics-Gynecology.—The University of Mississippi School of Medicine will hold its first Symposium on Psychosomatic Obstetrics-Gynecology March 4 at the University Medical Center, Jackson. The symposium has been accepted for credit by the American Academy of General Practice. The guest speakers will be Dr. Harry Fields, associate professor of obstetrics and gynecology, University of Pennsylvania School of Medicine, Philadelphia; Dr. James H. Ferguson, chairman, obstetrics and gynecology, University of Miami School of Medicine; and Dr. Phineas J. Sparer, professor of psychiatry and preventive medicine, University of Tennessee School of Medicine, Memphis. Drs. Michael Newton, Floy J. Moore, Blanche Lokard, Walter H. Simmons, and Clarence G. Sutherland, of the Medical School faculty in Jackson, also will lecture.

MISSOURI

Dr. Comroe to Lecture.—The University of Missouri School of Medicine, Columbia, will be visited by Dr. Julius H. Comroe Jr., professor of physiol-

ogy and director of the Cardiovascular Institute, University of California Medical School, San Francisco, March 5, 6, and 7. He will deliver a lecture on "Contributions of Pulmonary Physiology to Clinical Medicine" as part of the Squibb Centennial Lecture Program.

NEW YORK

New York City

Physicians' Art Exhibit.—The 24th annual "Exhibition of Physicians' Art," sponsored jointly by the New York Academy of Medicine and the New York Physicians Art Club, opened at the New York Academy of Medicine the evening of Jan. 26, closing Feb. 2. Only the works of physicians were exhibited, all of whom are amateur artists. The media included were oils, water colors, prints, drawings, sculptures, ceramics, and photographs. The exhibition was arranged by Dr. Albert C. Santy, chairman of The New York Academy of Medicine Art Committee, and Dr. Kurt F. Falkson, of the New York Physicians Art Club.

Health Careers Week.—New York City's first Health Careers Week was proclaimed by Mayor Robert F. Wagner Jan. 27. Sponsored by the Community Council of Greater New York, Health Careers Week "reflects the mounting concern felt by health agencies because of the extreme shortage of health personnel." According to Carl M. Loeb Jr., president of the Community Council, Health Careers Week (Feb. 1-7) is an attempt to alert the public to this important problem. Events planned around this week included changing the street sign of Times Square to Health Careers Square by Dr. Leona Baumgartner, honorary chairman of Health Careers Week, and two students; one student acted as commissioner of health for Feb. 2; the second student was invited to act as commissioner of hospitals for a day; a new pamphlet, "Opportunities for Careers in Health," published by the Community Council was distributed to schools and libraries.

PENNSYLVANIA

Philadelphia

Australian Lecturer.—Sir John Eccles, professor of physiology, John Curtin School of Medical Research, Australian National University, Canberra, Australia, will be a guest of Temple University on Feb. 23-24. Under the sponsorship of the Squibb Centennial Lecture Committee, he will lecture to the faculty and students of the School of Medicine on Feb. 23, 4:00 p. m., in the auditorium.

TEXAS

Rehabilitation Institute Opening.—The Texas Institute for Rehabilitation and Research, newest member of the Texas Medical Center team, opened

officially the week of Jan. 19. Dr. William A. Spencer, chairman, department of rehabilitation, announced. Formal dedication of the new institute will be held in May. Dr. Spencer said it is planned to move patients from the Wolff Home Polio Rehabilitation Unit and from the Southwestern Poliomyelitis and Rehabilitation Center. The new building of the Texas Institute for Rehabilitation and Research and its equipment cost about \$1,650,000. It has a 54-bed capacity and an area of 80,000 square feet. In addition there are laboratories and special study areas for research. It will be staffed by 80 professionals under the direction of Dr. Spencer and will require a total staff, including nonprofessionals, of 240 people.

VIRGINIA

Annual Hospital Postgraduate Program.—The Roanoke Memorial Hospital will hold its 10th annual postgraduate day program March 19 at Hotel Roanoke. Registration begins at 1:00 p. m. and the program at 2:00 p. m. The meeting is open to interested physicians and is approved for category I credit by the American Academy of General Practice. The program includes:

Pyelonephritis and Hypertension in Pregnancy Masquerading as Toxemia, Dr. Frank A. Finnerty, Georgetown University Medical School, Washington, D. C.

Transaminase and Other Serum Enzyme Tests in Clinical Medicine, Dr. Felix Wroblewski, Cornell University Medical School, New York City.

Functional Gastrointestinal Disease, Dr. Dwight L. Wilbur, Stanford University Medical School, San Francisco.

Experience with Transplantation of the Human Kidney and Renal Hypertension, Dr. J. Hartwell Harrison, Harvard Medical School, Boston.

For information write Dr. Charles L. Crockett Jr., Chairman, Medical Education Committee, Roanoke Memorial Hospital, Roanoke, Va.

WEST VIRGINIA

Poison Control Center in Weston.—The *West Virginia Medical Journal* of January reported that the state's first complete Poison Control and Information Center was set up at the Stonewall Jackson Memorial Hospital in Weston. Reportedly, there are but 26 other such centers in the United States. Carl F. Cline, hospital administrator, announced that the center will be operated on a 24-hour basis and will be available to physicians and hospitals throughout the state. Ninety-five antidotes are stored in the cabinet which will be kept at the hospital, along with two books, "Handbook of Emergency Toxicology," and "Clinical Toxicology of Commercial Products," which provide sufficient information to combat more than 20,000 different types of poisoning. The books contain a complete list of preparations, name their toxic elements, and supply the recommended antidotes and supportive or follow-up treatment. The center was donated to the hospital by Minter B. Ralston and

his son, Minter B. Ralston III, Weston pharmacists. All physicians and hospitals throughout the state may avail themselves of the services of the center when the need arises. The telephone number at the Stonewall Jackson Memorial Hospital in Weston is 1775.

WISCONSIN

Polish Visitor.—Dr. Zdzislaw Stolzmann, dean of the Medical School, Poznan, Poland, was a recent visitor to the University of Wisconsin, Madison. On Jan. 10, he visited the Medical Center under a Rockefeller grant, to discuss "The Experimental Program in Medical Education."

GENERAL

Report on Heart Fund.—Contributions to the 1958 Heart Fund totaled a record \$22,345,718, Charles Perry McCormick, Baltimore industrialist and national campaign chairman announced. This was a gain of more than 2 million dollars over the \$20,563,929 contributed to the Heart Fund in 1957. More than 9 million dollars of the 1958 total resulted from Heart Sunday collections conducted by over 1,500,000 volunteers visiting about 20,000,000 homes of their neighbors in 5,500 communities in a single day. The 1959 Heart Fund campaign will be conducted throughout the month of February by the American Heart Association and its affiliates. Heart Sunday will be observed on Feb. 22.

Plastic Surgeons Meeting in New York City.—The spring meeting of the American Society of Facial Plastic Surgery will be held March 18 at the Hotel Elysee, 60 E. 54th St., New York City. The program includes the following papers:_____

- Surgical Correction of Protruding Deformed Ears, Dr. Oscar J. Becker, Chicago.
- Management of Inferior Crus in Otoplasty, Dr. Sidney S. Feuerstein, New York City.
- The Problem of Implants in Rhinoplasty, Dr. Samuel M. Bloom, New York City.

The business meeting will be held at 5:30 p. m. and the dinner (\$12) at 7:00 p. m. For information write Dr. Samuel M. Bloom, 123 E. 83rd St., New York 28.

Meeting on Forensic Sciences in Chicago.—The 11th annual meeting of the American Academy of Forensic Sciences will be held Feb. 26-28 at the Drake Hotel, Chicago. The program includes two symposiums, "Developments in Forensic Science in 1958" and "Investigation of Potential Suicides." Foreign participants include: W. Allan Cregeen, FRCS, Toronto, Canada; D. Alan Eagleson, B.S. and L. Monkman, M.S., Toronto, Canada; C. G. Farmilo, Ph.D., Ottawa, Canada; and Dr. Francis E. Camps, London, England. Dr. Russell S. Fisher, Baltimore, is chairman of the program committee. The general business meeting will be held at 5

p. m., Feb. 26. For information write Dr. W. J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary-Treasurer.

Three Health Experts Visit South Africa.—Dr. Arthur J. Vorwald, of Wayne State University College of Medicine, Detroit, Theodore F. Hatch, professor of industrial health engineering, University of Pittsburgh, and Dr. Oscar A. Sander, of Milwaukee, were among the 15 representatives from seven countries who met in South Africa Feb. 9-21 to discuss their problems with pneumoconiosis in Johannesburg with scientists from the United Kingdom, Belgium, Germany, France, Switzerland, and Northern Rhodesia at the invitation of the Pneumoconiosis Research Unit of the South African Council for Scientific and Industrial Research. In addition to giving a series of papers, the delegates visited uranium mines and their medical clinics.

Health Bequests in 1958.—Eighty-two gifts and bequests each of a million dollars or more and totaling over a half billion dollars were made to American philanthropy in 1958, the current *Bulletin* of the American Association of Fund-Raising Counsel, Inc., has reported. The compilation showed that health and welfare received the greater proportion of the bequests, while education received the bulk of gifts made by living donors. Of the \$544,840,902 total, \$296,263,781 went to health and welfare causes, \$159,802,121 to education, \$16,275,000 to religious causes, and \$72,500,000 to the fine arts. The American Association of Fund-Raising Counsel is an organization of 27 firms which specialize in counseling on and management of fund campaigns for philanthropic organizations. Its membership covers the United States and Canada.

Assessment of Hospital Medical Staffs.—At its meeting Nov. 21 the Board of Trustees of the American Hospital Association adopted the following statement which was prepared by the Council on Planning, Financing and Prepayment on the subject of assessment of hospital medical staffs:

To advise member hospitals that:

- It is improper in principle to assess medical staff members on a compulsory basis for the day-to-day operation of the hospital.
- New hospital construction should be in response to a community need recognized not only by the hospital governing board but also by the hospital medical staff.
- It is vital to the success of a hospital's fund-raising campaign that the support and interest of the hospital medical staff be obtained prior to the campaign.
- Giving by the hospital medical staff should be on a voluntary basis, its campaign quota being set jointly by the hospital governing board and the hospital medical staff.

Dr. Edwin L. Crosby, 18 E. Division, Chicago 10, is director of the American Hospital Association.

Biological Photographers Meet in Iowa City.—The first Midwestern sectional meeting of the Biological Photographic Association will take place April 24-26 at the University of Iowa, Iowa City. Photographic specialists in medicine, dentistry, biology, and other sciences will attend, representing medical and dental schools, hospitals, research institutions, and science centers from Canada and nine states (Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota, and Wisconsin). A salon of color and black-and-white photographs will feature displays of clinical and specimen photography, photomicrography, and natural science. A motion-picture program is scheduled for April 24. The Biological Photographic Association was founded at Yale University in 1931 and has a world-wide membership. For information write Mr. Carroll H. Weiss, Director of Professional and Press Publicity, 160 Riverside Dr., New York 24.

Call for Decennial Pharmacopeial Convention.—In compliance with the provisions of the constitution and by-laws of the United States Pharmacopeial Convention, the several bodies that are believed to be entitled to representation at the 1960 decennial meeting of the convention are invited to appoint one delegate and one alternate to the meeting, to be held at the Hotel Statler, Washington, D. C., April 12-13, 1960. The constitution requires that each delegate and each alternate be an officer or a member of the academic staff of the college or school, or an active member of the association or society, or an employee of the division of federal government, that he represents. Credential forms will not be distributed until about Nov. 1, 1959, to be returned by Feb. 1, 1960. The names of delegates and alternates should not be sent until after receipt of the credential forms next November. Correspondence should be directed to the Secretary, Adley B. Nichols, 46 Park Ave., New York 16.

Seminar Cruise to Caribbean.—The fourth Postgraduate Medical Seminar Cruise, sponsored by Duke University School of Medicine, Durham, N. C., will begin April 2, sailing from New York to return April 14 (12 days) and calling seven hours at Wilmington, N. C. April 4 to visit the Orton Plantation and view the annual Azalea Festival. An alternate plan is to sail from Wilmington, N. C., April 4, to return April 13 (9 days). Ports of visit will include Nassau, Port-au-Prince, Kingston, and Cap Haitien. The faculty will include Drs. William McNeal Nicholson, professor of medicine and director of postgraduate education; Julian M. Ruffin, professor of medicine; and Doris A. Howell, department of pediatrics. The medical program constitutes 20 hours of formal teaching toward the 150 hours of postgraduate study required every three years. A certificate of attendance will be

issued. For information address: Director of Postgraduate Education, Duke University School of Medicine, Durham, N. C.

Photographic Exhibit at Student Convention.—A new Student American Medical Association photographic salon to exhibit "the best medical and general interest photographs in the country" is scheduled for the 1959 convention in Chicago, April 30-May 3. Medical students, interns, residents, and new physicians are eligible to participate. The two-part exhibition will be an annual event. Leitz awards will include Leica cameras and accessories as first prizes for each of the two categories. The aim of this photographic program is to encourage physician-photographers both in the scientific area and in photography as a fine art. Participants are asked to submit black and white prints of general interest photographs (preferably 11 x 14 in.) and color transparencies of medical photographs as soon as possible. Deadline is March 1. SAMA's address is 430 N. Michigan Ave., Chicago 11. Fifty of each of the two categories will be selected for exhibition. The two top awards are for the best medical picture and for the best general interest black and white photograph.

Dr. Nelson Passes Japanese Qualifying Examinations.—The world headquarters of Seventh-Day Adventists, Washington, D. C., has announced that Dr. Richard A. Nelson, a Seventh-Day Adventist physician at the church's Tokyo Sanitarium and Hospital, has become the first Caucasian physician to pass Japanese medical qualifying examinations given in the Japanese language. Six years ago Japan changed its medical examining system by announcing that any physician desiring medical practice credentials in Japan must take examinations in the Japanese language. A graduate of the College of Medical Evangelists (in 1951) at Loma Linda, and Los Angeles, Calif., Dr. Nelson went to Japan in December, 1955, after completing a surgical residency at the White Memorial Hospital, Los Angeles. Since arriving in Japan he has been studying for the examination, learning nearly 4,000 special Japanese characters of a purely medical nature. A total of 417 persons took the examinations in Tokyo; 203 passed. Dr. Nelson passed his Canadian medical examinations before going to the Far East in 1955 as a "fire-escape" to practice in British countries in case he did not pass the Japanese test. He will be a staff physician at the Adventists' 100-bed Tokyo Sanitarium and Hospital.

Obstetricians and Gynecologists Hold Annual Meeting.—The American College of Obstetricians and Gynecologists will hold its annual meeting in Atlantic City, April 6-8, with general sessions in Convention Hall. The program will include papers by obstetricians and gynecologists from all parts of

the country, breakfast and clinical conferences, panels, motion-picture programs, and scientific exhibits. One panel will deal with radiation hazards in obstetrics and gynecology, and another will cover psychosomatic aspects. A feature will be the presentation of 12 research project reports, to include the early diagnosis of multiple pregnancy, labor problems, oxygen administration, anesthetics, endocrine functions, and other topics. The college business session will be held on the second day, when Dr. Robert G. Craig, San Francisco, will deliver his presidential address. The installation of Dr. John I. Brewer, professor of obstetrics and gynecology, Northwestern University Medical School, Chicago, as president will take place on the final day. For information write Mr. Donald F. Richardson, Executive Secretary, The American College of Obstetricians and Gynecologists, P. O. Box 749, Chicago 90.

Fellowships for Research in South-East Asia.—The South-East Asia Treaty Organization has announced a Research Fellowship Program for 1959-60 "to encourage the study and research of such social, economic, political, cultural, scientific, and educational problems as give insight into the present needs and future development of the Treaty area, viewed against a background of SEATO objectives." Fellowships are offered to candidates from member states (Australia, France, New Zealand, Pakistan, the Philippines, Thailand, the United Kingdom, and the United States). A candidate must be a national of a member state and should plan to undertake his research in SEATO countries situated within the Treaty area (the general area of South-East Asia, including also the entire territories of the Asian Parties, and the general area of the South-West Pacific, not including the Pacific area north of 21°30' north latitude). The applicant's project should be of interest to SEATO and, preferably, to two or more member countries. Candidates will be selected on the basis of their special aptitude and experience for carrying through a major project of research. Academic qualifications (preferably the doctoral degree or its equivalent), professional experience beyond the completion of training, and published material will be taken into account. Preliminary screening of American candidates will be by the Committee on International Exchange of Persons of the Conference Board of Associated Research Councils, which will recommend candidates to the Department of State and the President's Board of Foreign Scholarships. Final selection of candidates will be announced in August. It is expected that only one or two grants will be available to candidates from the United States. The grant will provide a monthly allowance of \$400 and tourist-class return air travel to the country or countries of research. Grants may be authorized for periods of from 4 to

10 months. For application forms and information write: Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Ave., Washington 25, D. C. Applications should be submitted no later than April 15.

CANADA

Establish Council on Hospital Accreditation.—Dr. A. Lawrence Chute, chief of pediatrics, Hospital for Sick Children, Toronto, has been appointed chairman of the newly formed Canadian Council on Hospital Accreditation. The appointment coincided with the inauguration of the first all-Canadian program designed to improve and develop the standard of hospital care in Canada. The program officially came into being at a special ceremony in the Board Room of The Canadian Medical Association, Toronto, Jan. 17. Dr. John I. Brewer, Chicago, chairman of the Joint Commission on the Accreditation of Hospitals handed over the responsibility of approving Canadian hospitals to the new council. Previously, Canadian hospitals were accredited by the Joint Commission. Dr. William I. Taylor, executive director of the Canadian Council on Hospital Accreditation, stated that the function of the program was to survey hospitals at their request, to ensure the welfare and safety of the patient. He mentioned that every aspect of hospital administration and operation would be looked into by the physician-surveyor. If the survey report met the approval of the Council, the hospital concerned would be certified as an accredited hospital. If a hospital received an unfavorable report, certain recommendations would be made but there was no obligation on the hospital's part to implement them. The immediate past-chairman of the council is Dr. E. Thibault, of Montreal. The new chairman will be supported by a board of 11 other representatives from the following associations: The Canadian Hospital Association, The Canadian Medical Association, The Royal College of Physicians and Surgeons of Canada, and L'Association des Medecins de Langue Francaise du Canada. Dr. Taylor said that action to initiate an all-Canadian program took place at the 1950 annual meeting of The Canadian Medical Association, when a committee within the C. M. A. was organized and liaison began with the associations previously mentioned. Of about 700 hospitals in Canada, some 43% reportedly have been accredited. As all accredited hospitals are resurveyed every three years, it is expected that about 130 will be inspected this year, which will include the initial surveys.

FOREIGN

Istanbul University Received Rehabilitation Bookshelf.—On Nov. 20, in Istanbul, Turkey, the first rehabilitation bookshelf of American rehabilitation

literature reportedly given to the rehabilitation library of another nation was presented to the Medical College of Istanbul University. Mr. Willis C. Gorthy, director of the Institute for the Crippled and Disabled, made the presentation on behalf of the International Society for the Welfare of Cripples and the People to People Program's Committee for the Handicapped. The committee is headed by Maj. Gen. Melvin J. Maas, who also heads the President's Committee on Employment of the Physically Handicapped. The international society and the people to people group collaborated in assembling and providing the 43-volume bookshelf. Mr. Gorthy, in Istanbul as head of a United Nations' mission on rehabilitation to the government of Turkey, presented two token books from the bookshelf to Dr. Uveys Maskar, acting dean of the university's Medical College. The balance of the bookshelf followed by special shipment.

CORRECTION

Saddle Block Anesthesia.—In the article by Dodge et al. entitled "Late Sequelae of Saddle Block Anesthesia in Obstetrics" in the Jan. 31, 1959, issue of *THE JOURNAL*, pages 429-432, the opening statement of the next to last paragraph on page 430 should have read "Saddle block anesthesia . . . was employed 13,299 times in this hospital since 1946." The period of observation here referred to was 1946 to 1957. The opening sentence of the next paragraph should have read "The records of 3,147 patients, given saddle block anesthesia during the six years of our study, were reviewed."

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Part II only, April 21-22; Parts I and II, June 16-17; Part I only, Sept. 9-10. Examinations must be received at least six weeks in advance of a specific examination date. Examining centers established after close of registration. Exec. Sec., Dr. John P. Hubbard, 133 South 36th St., Philadelphia 4.

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: Stations around the world, Feb. 17. Deadline for foreign applications was Nov. 17. The following examination will be held Sept. 22 with application deadline of June 22. Exec. Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Ill.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Written*. Montgomery, June 16-18. Sec., Dr. D. G. Gill, State Office Bldg., Montgomery 4.

ALASKA: * *On application* in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

ARKANSAS: * *Examination and Reciprocity*. Little Rock, June 11-12. Sec., Dr. Joe Verser, Harrisburg.

CALIFORNIA: *Written*. Los Angeles, Mar. 2-5. Sec., Mr. Wallace D. Thompson, Room 536, 1020 N. Street, Sacramento.

CONNECTICUT: * *Regular. Examination*. Hartford, March 10-12. Acting Sec., Dr. Louis P. Hastings, 160 St. Ronan St., New Haven.

FLORIDA: * *Examination*. Miami Beach, June 22-24. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami 36.

GEORGIA: *Examination and Reciprocity*. Atlanta, June. Sec., Mr. C. L. Clifton, 224 State Capitol, Atlanta 3.

GUAM: *Subject to Call. Act. Sec.*, Dr. F. L. Conklin, Agaña.

MAINE: *Examination*. Portland, March 10-12. *Endorsement*. Portland, March 10. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

MICHIGAN: * *Examination*. Ann Arbor and Detroit, June 8-10. Sec., Dr. E. C. Swanson, 118 Stevens T. Mason Bldg., West Michigan Ave., Lansing 8.

MINNESOTA: * *Reciprocity*. St. Paul, February. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul.

MONTANA: *Examination and Reciprocity*. Helena, April 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEBRASKA: * *Examination*. Omaha, June. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: *Examination and Endorsement*. Concord, Mar. 11-14. Sec., Dr. Edw. W. Colby, 61 So. State St., Concord.

NEW MEXICO: * *Examination and Reciprocity*. Santa Fe, May 18-19. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

NORTH CAROLINA: *Examination*. June Asst. Sec., Mrs. Louise J. McNeill, 716 Professional Bldg., Raleigh.

OKLAHOMA: * *Examination*. Oklahoma City, June 2-3. Exec. Sec., Mrs. E. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON: * *Written*. Portland, Apr. 17-19. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

PUERTO RICO: *Examination and Reciprocity*. San Juan, March 3. Acting Secretary, Dr. Herminio Mendez Herrera, Box 9156, Santurce.

SOUTH CAROLINA: *Reciprocity*. Columbia, May 12; *Examination*. Columbia, June 23-24. Sec., Dr. H. E. Jervy, Jr., 1829 Blanding St., Columbia.

TEXAS: * *Examination and Reciprocity*. Fort Worth, June 22-24. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH: *Examination*. Salt Lake City, July 8-10. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City 1.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination*. Little Rock, May 4-5. Sec., Dr. S. C. Dellinger, University of Arkansas, Fayetteville.

FLORIDA: *Examination*. Miami, June 6. Sec., Mr. M. W. Emmel, University of Florida, Box 340, Gainesville.

KANSAS: *Examination*. Kansas City, June. Sec., Dr. L. C. Heckert, Pittsburg.

OKLAHOMA: *Examination*. Oklahoma City, Mar. 27-28. Exec. Sec., Mrs. L. Haidek, 813 Braniff Bldg., Oklahoma City.

OREGON: *Written*. Mar. 7. Sec., Dr. Earl M. Pallett, Box 5175, Eugene.

RHODE ISLAND: *Examination*. Providence, Feb. 18. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TEXAS: *Examination*. Austin, Galveston, Houston, Apr. 17-18. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination*. Madison, April 4. Final date for filing application is March 27. Milwaukee, June 6. Final date for final application is May 29. Sec., Mr. W. H. Barber, 621 Ransom St., Ripon.

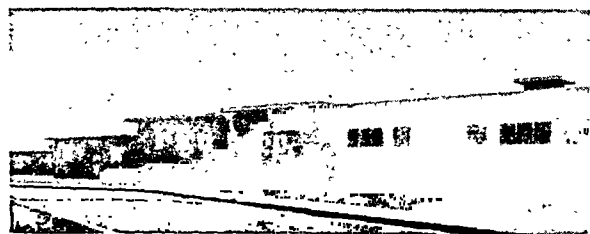
*Basic Science Certificate required.

GOVERNMENT SERVICES

AIR FORCE

Award for Dr. Strughold.—Dr. Hubertus Strughold, advisor for research and professor of space medicine at the Air Force School of Aviation Medicine, was given the Dr. John J. Jeffries award, in January, for his research in space and aviation medicine. The award is presented annually by the Institute of the Aeronautical Sciences. Often called "the father of space medicine," Dr. Strughold was the first scientist to define specific areas to be investigated in space medicine, the first to give a comprehensive definition of space and space equivalency, and was the first chief of the School of Aviation Medicine's Department (now Division) of Space Medicine.

New Hospital.—The new U. S. Air Force Hospital at Larson Air Force Base, Wash., was formally dedicated on Dec. 13, 1958. This 50-bed, air-conditioned hospital has an audiovisual nurse call



New Air Force Hospital at Larson Air Force Base, Wash.

system, centralized oxygen and vacuum system, public address and program distribution system, and a centralized food service system. Specialty services include pediatrics, obstetrics and gynecology, general surgery, and internal medicine. Lieut. Col. John R. Troxell, M. C., is commander of the hospital.

NAVY

Lieutenant Novosad Awarded Legion of Merit.—Lieut. Charles L. Novosad Jr., M. C., U. S. N. R. (inactive), was awarded the Legion of Merit by the President of the United States for outstanding services. On July 12, 1957, when a helicopter crashed and burned on the ice near the base at McMurdo Sound, Antarctica, resulting in the instant death of one man and critical injuries to two others, Lieutenant Novosad was directly responsible for saving the lives of the two seriously injured men. He is now practicing medicine at the Headlee Clinic, Odessa, Texas.

VETERANS ADMINISTRATION

Hospital Entertainment Program.—An advisory group of top figures in the entertainment world will help Veterans Administration hospitals make best use of radio and television as beneficial activities for veteran patients. The advisors will work through the Veterans Hospital Radio and Television Guild, a voluntary organization with headquarters in New York City, which for years has been encouraging hospitalized veterans to try their hand at radio-television writing, acting, and production. The Guild sends its members—professionals in radio and television—into VA hospitals to teach veterans all the elements of radio-television. It also sends VA hospitals a monthly supply of professional radio and television scripts, to be produced and acted by patients for the enjoyment of their fellow-patients. The purpose is not to make professionals of veteran patients. Instead, working closely with the VA hospital recreation staff, the Guild attempts to provide patients with a worthwhile activity while they spend long days and weeks in the hospital.

FOOD AND DRUG ADMINISTRATION

Personal.—Dr. Oral L. Kline was made head of the Division of Nutrition, Dr. Henry Fischbach of the Division of Food, and Dr. Leo Friedman was designated Director of Research for the Division of Nutrition. Dr. Kline succeeded Dr. E. M. Nelson, who died in December, and Dr. Fischbach succeeded Dr. Kline.

PUBLIC HEALTH SERVICE

Influenza Vaccine for Cardiac Patients.—Drs. Leroy Burney, surgeon general of the Public Health Service, and Francis L. Chamberlain, president of the American Heart Association, believe that patients with heart or lung diseases are more susceptible to the hazards of influenza than is the general population. This increased risk is shown by more severe illness and by higher case fatality rates among patients with these diseases. Patients with, or prone to, pulmonary congestion secondary to heart disease are an especially high risk group. Studies with influenza vaccine have shown that its use significantly reduces the incidence and probably the severity of influenza infection in the presence of local or widespread epidemics. Furthermore, use of the vaccine is contraindicated only in patients who are allergic to the components of the vaccine. The type of local and systemic reactions to vaccine have not been such as to constitute any significant hazard to patients with cardiac disease. Persons with cardiovascular disease are urged to consult their physicians as to the advisability of obtaining influenza vaccination.

DEATHS

Abeken, Frederick Gustavus ® Comdr., U. S. Navy, retired, St. Louis; Washington University School of Medicine, St. Louis, 1899; service member of the American Medical Association; fellow of the American College of Surgeons; entered the U. S. Navy in 1903 and retired Aug. 1, 1933; died in the U. S. Naval Hospital, Oakland, Calif., Sept. 23, aged 80.

Acree, Walter Enis, Huntsville, Ark. (licensed in Arkansas in 1907); served as president of the Madison County Medical Society; on the staff of the Fayetteville City Hospital, where he died Nov. 5, aged 80.

Baker, Max, Rumford, R. I.; Boston University School of Medicine, 1923; died Nov. 25, aged 62.

Barnhart, Jessie May Lockwood, Portland, Ore.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1908; died in the Emanuel Hospital June 29, aged 85.

Baylis, Henry Eugene, Kerrville, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1893; veteran of World War I; died Nov. 29, aged 91.

Bell, Lachlan J., Detroit; Michigan College of Medicine and Surgery, Detroit, 1896; died in the Wayne County General Hospital Sept. 25, aged 83.

Binford, William Sherwood ® Davenport, Iowa; State University of Iowa College of Medicine, Iowa City, 1900; past-president of the Scott County Medical Society; presented a 50-year medallion by the Iowa State Medical Society; veteran of World War I; on the staff of St. Luke's Hospital; died Dec. 1, aged 83.

Binkley, Roy Spitler ® Dayton, Ohio; Starling-Ohio Medical College, Columbus, 1911; past-president of the Montgomery County Medical Society; member of the American Academy of Ophthalmology and Otolaryngology; associated with Barney Convalescent Hospital, St. Elizabeth Hospital, where he was formerly chief of staff, and the Good Samaritan Hospital, where he died Nov. 26, aged 75.

Black, James Harvey ® Dallas, Texas; born in Huntington, W. Va., March 27, 1884; Southwestern University Medical College, Dallas, Texas, 1907; consultant in internal medicine at the Southwestern Medical School of the University of Texas, where he was professor of clinical medicine for many years; served on the faculty and in 1914-1915 dean

at Southern Methodist University Medical Department; formerly on the faculty at Baylor University College of Medicine; chairman, Section on Pathology and Physiology, American Medical Association, 1931-1932; past-president and secretary of the American Association for the Study of Allergy; past-president of the Texas Allergy Association and the Texas Pathological Society; past-president of the American Society of Clinical Pathologists; member of the American Academy of Allergy and was the first recipient of a prize for his paper read at its first meeting on Dec. 11, 1944; fellow of the American College of Physicians and the American Public Health Association; specialist certified by the American Board of Internal Medicine; consultant, Parkland Memorial Hospital and the Children's Medical Center; formerly on the editorial board, and an editor of the allergy and biological abstracts section, *Journal of Allergy*; revised "Practice of Allergy" and "Primer of Allergy"; died Nov. 30, aged 74.

Bornscheuer, Albert Adam, Pittsburgh; Johns Hopkins University School of Medicine, Baltimore, 1913; an associate member of the American Medical Association; member of the American Society of Plastic and Reconstructive Surgery; fellow of the American College of Surgeons; on the staff of St. Francis Hospital; died Nov. 22, aged 70.

Braswell, Leon Melvin, Lynchburg, Va.; Meharry Medical College, Nashville, Tenn., 1936; died Nov. 6, aged 54.

Braunstein, William, Long Island City, N. Y.; Masarykova Universita Fakulta Lékařská, Brno, Czechoslovakia, 1928; an associate member of the American Medical Association; veteran of World War II; died in the Veterans Administration Hospital in New York City Nov. 30, aged 63.

Broudo, Philip Harmon ® Detroit; University of Illinois College of Medicine, Chicago, 1915; member of the Radiological Society of North America; died Nov. 23, aged 71.

Buffett, Claude, Honolulu, Hawaii; McGill University Faculty of Medicine, Montreal, Que., Canada, 1900; an associate member of the American Medical Association; died in the Queen's Hospital Nov. 1, aged 84.

Butterfield, George Kittredge ® Merrimack, N. H.; Tufts College Medical School, Boston, 1903; at one time on the faculty of Albany (N. Y.) Medical College; specialist certified by the American Board of

® Indicates Member of the American Medical Association.

Psychiatry and Neurology; member of the American Psychiatric Association; formerly assistant superintendent of Butler State Hospital in Providence, R. I.; and medical superintendent of the Marshall Sanitarium in Troy, N. Y.; died in the Memorial Hospital, Nashua, Sept. 8, aged 77.

Claverie, Eugene Hypolite Jr. @ New Orleans; Louisiana State University Medical Center, New Orleans, 1938; member of the American Academy of General Practice; also a graduate in pharmacy; died in the Montelepre Memorial Hospital Nov. 23, aged 53.

Coelho, Thome Emilio Pires @ Fall River, Mass.; Universidade de Lisboa Faculdade de Medicina, Portugal, 1915; died Nov. 22, aged 68.

Coleman, James A. @ Toledo, Ohio; Toledo Medical College, 1898; died in St. Vincent's Hospital Sept. 20, aged 91.

Craig, John Percy @ Chester, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1909; a courtesy member of the staff of Chester Hospital; served on the staffs of the Hahnemann Hospital and the J. Lewis Crozer Hospital, where he was eye, ear, nose and throat chief until 1957, and where he died Nov. 22, aged 75.

Creighton, William James, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1904; an associate member of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; veteran of World War I; member of the staffs of the Germantown and Wills Eye hospitals; on the staff of the Lankenau Hospital, where he died Sept. 21, aged 76.

Cremens, John Francis @ Paterson, N. J.; University of Georgia Medical Department, Augusta, 1916; died in the Valley Hospital, Ridgewood, Nov. 13, aged 70.

Cunningham, Isaac W. @ Richlands, Va.; Medical College of Virginia, Richmond, 1909; on the staff of the Mattie Williams Hospital; died Nov. 26, aged 80.

Davis, Ralph Allison @ Chicago; Northwestern University Medical School, Chicago, 1925; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; assistant professor of ophthalmology at Northwestern University Medical School; on the staffs of the Swedish Covenant Hospital and the Chicago Wesley Memorial Hospital, where he died Dec. 10, aged 59.

Deason, Giles Arthur @ Shreveport, La.; Baylor University College of Medicine, Dallas, 1914; service member of the American Medical Association; veteran of World War I; for many years associated

with the Veterans Administration; served on the staff of the Veterans Administration Center, where he died Nov. 25, aged 70.

Delaney, William Joseph @ Marlboro, Mass.; College of Physicians and Surgeons, Boston, 1918; for many years on the staff of the Marlborough Hospital; died in Brattleboro, Vt., Nov. 25, aged 63.

DeRiemer, Robert Posey @ Spokane, Wash.; University of Pennsylvania School of Medicine, Philadelphia, 1927; served overseas during World War I; for many years associated with the Deaconess Hospital, where he served as both president and secretary of the medical staff; died Nov. 19, aged 61.

Diamand, Morris, Worcester, Mass.; Medizinische Fakultät der Universität, Vienna, Austria; 1920; member of the Massachusetts Medical Society; for many years county physician; served on the staffs of Henry Heywood Memorial Hospital in Gardner and the Athol Memorial Hospital in Athol; died in the Worcester City Hospital Sept. 7, aged 66.

Dickson, Ellsworth Joseph Murray @ Needham, Mass.; Tufts College Medical School, Boston, 1912; formerly a medical missionary in China; associated with the Newton-Wellesley Hospital in Newton and the Glover Memorial Hospital in Needham; died Nov. 7, aged 75.

Elkins, Higdon Bryant @ Iowa City, Iowa; Washington University School of Medicine, St. Louis, 1930; professor of radiology at the State University of Iowa College of Medicine; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, Radiological Society of North America, American College of Radiology, and the American Radium Society; veteran of World War II; associated with the University Hospitals; died Nov. 29, aged 51.

Emch, Minna Elizabeth Libman @ Chicago; born in Vilna, Russia, Aug. 10, 1904; University of Illinois College of Medicine, Chicago, 1929; specialist certified by the American Board of Psychiatry and Neurology; served on the faculty of Loyola University School of Medicine and Northwestern University Medical School; member of the American Psychoanalytic Association, American Psychiatric Association, American Association for the Advancement of Science, Sigma Xi, and Phi Beta Kappa; a member of the board of the Illinois Society for Mental Health and chairman of the committee on membership and education of the Chicago Psychoanalytic Society; supervising analyst at the Chicago Institute of Psychoanalysis; a consultant to the Elgin (Ill.) State Hospital; served as senior physician in charge of the women's psychiatric service at the Worcester (Mass.) State Hospital; died Sept. 28, aged 54.

Emmens, Thomas Holmes @ Medford, Ore.; University of Oregon Medical School, Portland, 1939; specialist certified by the American Board of

Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; veteran of World War II; on the staffs of the Sacred Heart and Community hospitals; died in Eugene Nov. 8, aged 46.

Farley, Linwood, Williamsburg, Va.; Medical College of Virginia, Richmond, 1928; member of the Medical Society of Virginia, and the American Public Health Association; director of public health for the counties of Charles City, York, James City, New Kent, and the city of Williamsburg; served as president of the Williamsburg-James City County Medical Society; formerly health officer of Hanover County; died Nov. 18, aged 58.

Flory, Orville H., St. Edward, Neb.; Kansas City (Mo.) Medical College, 1891; president of the First National Bank of St. Edward; died in the Boone County Community Hospital, Albion, Nov. 3, aged 89.

Foote, Frederick Sanford @ San Francisco; University of California School of Medicine, San Francisco, 1925; assistant clinical professor of surgery at his alma mater; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; veteran of World War II; associated with the University of California and Franklin hospitals; died Nov. 9, aged 61.

Fosque, George Lee @ Onancock, Va.; Jefferson Medical College of Philadelphia, 1901; died Nov. 29, aged 81.

Fox, Maurice Simpson @ Vincennes, Ind.; Indiana University School of Medicine, Indianapolis, 1930; member of the American College of Allergists; veteran of World War II; on the staff of the Good Samaritan Hospital, where he died Nov. 21, aged 57.

Freeman, Floyd Milford @ Goshen, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; past-president of the Elkhart County Medical Society; died in the Goshen General Hospital Nov. 25, aged 75.

Gans, Edward Mathias @ Harlowton, Mont.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1905; past-president the Medical Association of Montana and the Fergus County Medical Society; named general practitioner of the year by the American Medical Association in 1956; named the nation's outstanding Catholic doctor; Veteran of World War I; died in the Wheatland Memorial Hospital Nov. 30, aged 82.

Garton, Avery M. @ Chanute, Kan.; University of Kansas School of Medicine, Kansas City, 1908; on the staff of the Neosho Memorial Hospital; died Nov. 27, aged 74.

Gay, Charles Francis @ Brockport, N. Y.; University of Rochester School of Medicine and Dentistry, Rochester, N. Y., 1936; member of the American

Academy of General Practice; veteran of World War II; formerly member of the board of education; associated with the Lakeside Memorial Hospital, where he died Nov. 9, aged 47.

Gorlin, David Oscar, Ozone Park, N. Y.; George Washington University School of Medicine, Washington, D. C., 1928; member of the Medical Society of the State of New York and the American College of Chest Physicians; veteran of World War II; died Nov. 11, aged 55.

Haley, Lewis Clay @ Axton, Va.; Medical College of Virginia, Richmond, 1910; on the staff of the Martinsville (Va.) General Hospital; died Nov. 17, aged 89.

Hampton, George Robert, Orange, Conn.; Georgetown University School of Medicine, Washington, D. C., 1909; member of the Medical Society of New Jersey; an associate member of the American Medical Association; for many years on the staff of the New Jersey State Hospital in Greystone Park; died Nov. 30, aged 80.

Handis, George Alexander, Bakersfield, Calif.; Flint Medical College of New Orleans University, New Orleans, 1909; decorated by the late President Roosevelt for his services during World War II; died Nov. 17, aged 77.

Henning, Carl @ Hanover, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; veteran of World War I; served as county coroner, county health officer and county physician; died in the King's Daughters' Hospital, Madison, Nov. 24, aged 79.

Herzer, Henry Albert @ Albion, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; died in Alma Nov. 28, aged 89.

Hill, Courtney Hamilton @ Monroe, La.; Chicago College of Medicine and Surgery, 1912; on the staff of St. Francis Hospital; died in the Ochsner Foundation Hospital in New Orleans Nov. 29, aged 74.

Hoff, Louis Latzer, Holyoke, Mass.; Baltimore Medical College, 1907; died in Holyoke Hospital Nov. 28, aged 73.

Holden, Richard James, Baker, Mont.; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1945; died Oct. 4, aged 37.

Huggard, Leslie Herbert @ Limestone, Maine; University of Vermont College of Medicine, Burlington, 1905; died in the Cary Memorial Hospital in Caribou Nov. 22, aged 84.

Jackson, Elbert William @ Paducah, Ky.; University of Louisville (Ky.) Medical Department, 1912; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; veteran

of World War I; past-president and vice-president of the Kentucky State Medical Association; past-president of the Kentucky Surgical Society; for many years member of the county board of health; served on the staffs of the Riverside, Illinois Central, and Western Baptist hospitals; died Nov. 28, aged 71.

Johnson, Margaret Lee, Boulder, Colo.; University of Colorado School of Medicine, Denver, 1908; at one time director of physical education for women, University of Colorado; associated with the Boulder-Colorado Sanitarium and Hospital and the Community Hospital, where she died Nov. 9, aged 83.

Joyner, Powell Winfred @ Enfield, N. C.; Syracuse University College of Medicine, 1932; member of the American Academy of General Practice; past-president of the Halifax County Medical Society; died in Rocky Mount Nov. 29, aged 51.

Kanai, Matsukichi, Albuquerque, N. M.; Rush Medical College, Chicago, 1936; certified by the National Board of Medical Examiners; died Nov. 22, aged 53.

Lakner, Edward William @ Cleveland; University of Michigan Medical School, Ann Arbor, 1930; fellow of the American College of Surgeons; member of the staffs of St. Luke's, St. Ann's, and St. Alexis hospitals; died in the Cleveland Clinic Hospital Nov. 18, aged 55.

Lanier, Lucien Herbert @ Texarkana, Ark.; Barnes Medical College, St. Louis, 1904; veteran of World War I; member of the staff of the Michael Meagher Memorial Hospital, where he served as secretary and chief of staff for two terms each; died in St. Michael's Hospital Nov. 21, aged 78.

Lawley, Brace Irving @ Arlington, Mass.; Tufts College Medical School, Boston, 1910; on the staff of the Symmes Arlington Hospital; died Nov. 30, aged 79.

Littlepage, Thomas Mellen @ Butler, Ala.; Medical College of Alabama, Mobile, 1904; for many years county health officer; died in the Anderson Infirmary, Meridian, Miss., Nov. 22, aged 79.

Loewenberg, Samuel Aaron @ Philadelphia; Medico-Chirurgical College of Philadelphia, 1903; clinical professor of medicine at Jefferson Medical College; formerly on the faculty of his alma mater; specialist certified by the American Board of Internal Medicine; member of the Endocrine Society; fellow of the American College of Physicians; on the staffs of Northern and Southern Divisions of the Einstein Medical Center, and the Philadelphia General Hospital; died Dec. 4, aged 77.

Loveless, James Clark @ Lamesa, Texas; University of Texas School of Medicine, Galveston, 1906; served on the draft board during World War II; died in the Lamesa General Hospital Nov. 29, aged 80.

Lundquist, Carl William, Swea City, Iowa; Keokuk (Ia.) Medical College, College of Physicians and Surgeons, 1907; died in Estherville Nov. 10, aged 84.

McCoy, Thomas Cresap @ Waterville, Maine; Columbia University College of Physicians and Surgeons, New York City, 1905; formerly practiced in New York City; past-president of the Kennebec County Medical Society; veteran of World War I; in 1944 appointed an examiner for the Civil Aeronautics Administration and in 1949 was named an airline examiner; associated with the Sisters' Hospital; died in the Veterans Administration Center in Togus Nov. 9, aged 73.

McCracken, George K., Ossining, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1926; for many years associated with Sing Sing Prison; died Dec. 5, aged 59.

McDonald, Robert Francis, Brooklyn; Cornell University Medical College, New York City, 1901; an associate member of the American Medical Association; for many years on the staff of St. Mary's Hospital, where he died Nov. 21, aged 78.

McKirahan, Josiah Ralph, Des Moines, Iowa; Rush Medical College, Chicago, 1902; at one time secretary-treasurer of the Kearney County (Neb.) Medical Society; veteran of World War I; died in Dunedin, Fla., Nov. 6, aged 80.

McNamara, John Gerard @ Brooklyn; born in Brooklyn, Dec. 25, 1894; Long Island College Hospital, Brooklyn, 1921; specialist certified by the American Board of Orthopaedic Surgery; member of the American Academy of Orthopaedic Surgeons; fellow of the American College of Surgeons; clinical assistant professor of orthopedic surgery, State University of New York College of Medicine, Brooklyn; last June was honored as "Doctor of the Year" by the Bay Ridge Medical Association, of which he was past-president; past-president of the Catholic Physicians' Guild of the Diocese of Brooklyn and of the Celtic Medical Association of New York; associated with Victory Memorial Hospital, Lutheran Medical Center, St. Charles Hospital, and the Long Island College Hospital, where he died Dec. 2, aged 63.

Maher, John Matthew @ Stratford, Conn.; Boston University School of Medicine, 1927; formerly on the faculty of Yale University School of Medicine in New Haven; served on the staffs of the Hospital for Joint Diseases in New York City and the Bridgeport (Conn.) Hospital, where he died Nov. 24, aged 60.

Marcus, Ida Irma, Chicago; Deutsche Universität Medizinische Fakultät, Prague, Czechoslovakia, 1920; on the staff of the American Hospital; died in the Louis A. Weiss Memorial Hospital Dec. 3, aged 64.

Maresch, George, Denver; State University of Iowa College of Medicine, Iowa City, 1902; veteran of World War I; served with the Veterans Administration in Portland, Ore., Boise, Idaho, Ogden, Utah, and Denver; died in Mercy Hospital Nov. 20, aged 78.

Maxwell, William Clark, Pittsburgh; University of Pittsburgh School of Medicine, 1902; an associate member of the American Medical Association; on the staff of the Columbia Hospital in Wilkesburg, Pa.; died Nov. 28, aged 83.

Meany, Daniel Edward, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; for many years associated with St. Bernard's Hospital; died Dec. 6, aged 72.

Motter, Thomas Ira @ Oak Park, Ill.; Chicago Homeopathic Medical College, 1897; Rush Medical College, Chicago, 1899; associated with West Suburban Hospital, where he was a trustee; died Nov. 20, aged 86.

Muir, Mark Devlin @ Captain, U. S. Army, San Rafael, Calif.; Creighton University School of Medicine, Omaha, 1955; service member of the American Medical Association; interned at St. Mark's Hospital in Salt Lake City; resident in psychiatry at the Letterman Army Hospital in San Francisco; died Nov. 22, aged 31.

Nelson, Clyde Vincent, Los Angeles; College of Physicians and Surgeons, medical department of the University of Southern California, Los Angeles, 1914; served on the staffs of the California Lutheran and Queen of Angels hospitals; died Nov. 21, aged 74.

Parsche, Thomas William @ Ocean Springs, Miss.; Rush Medical College, Chicago, 1903; formerly practiced in Chicago, where he was associated with Henrotin, St. Joseph, and Edgewater hospitals; member of the Illinois State Medical Society; died in Gulfport Dec. 9, aged 77.

Pease, George Norman @ La Jolla, Calif.; Cornell University Medical College, New York City, 1907; member of the founders group of the American Board of Surgery; formerly on the faculty of the University of Oregon Medical School in Portland; member of the Oregon State Medical Society; fellow of the American College of Surgeons; veteran of World War I; served on the staff of the Hoag Memorial Hospital in Newport Beach; formerly on the staffs of University of Oregon Medical Hospital, Good Samaritan, and St. Vincents hospitals in Portland; died in Bend, Ore., Nov. 15, aged 76.

Perdue, Thomas Rugely, Castro Valley, Calif.; University of Kansas School of Medicine, Kansas City, Kan., 1947; assistant health officer of Alameda County; formerly health officer of Parsons, Kan., and Bozeman, Mont.; served on the staff of the Highland-Alameda County Hospital in Oakland; died Nov. 21, aged 34.

Pissoort, Elizabeth Petronville, New York City; Université Libre de Bruxelles Faculté de Médecine, Belgium, 1923; died in Malaga, Spain, Nov. 20, aged 68.

Rawles, Benjamin Watkins @ Richmond, Va.; Medical College of Virginia, Richmond, 1897; died Nov. 26, aged 88.

Reekie, Richard Douty @ Spokane, Wash.; born in Seattle Dec. 2, 1900; University of Michigan Medical School, Ann Arbor, 1933; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons, past-president of the Spokane County Medical Society and the Spokane Surgical Society, past-president and vice-president of the Pacific Northwest Obstetrical and Gynecological Society; veteran of World War II; consultant in obstetrics and gynecology at the University of Washington School of Medicine in Seattle; associated with Salvation Army Booth Memorial Hospital, Deaconess Hospital, Sacred Heart Hospital, and St. Luke's Hospital; consultant, Veterans Administration; died Nov. 23, aged 57.

Richards, Paul Snelgrove @ Salt Lake City; born in Salt Lake City Nov. 25, 1892; Harvard Medical School, Boston, 1920; interned at the Cincinnati General Hospital; received residency training at Boston Free Hospital for Women and Boston Lying-In Hospital; served on the faculty of the University of Utah College of Medicine; specialist certified by the American Board of Preventive Medicine and Occupational Medicine; fellow of the American College of Surgeons; member of the Council on Industrial Health of the American Medical Association; member of the Industrial Medical Association and the American Industrial Hygienists' Association; consultant to the U. S. Public Health Service; served 16 years as a member and 10 years as president of the Jordan District Board of Education; instrumental in the building of the Bingham High School in Copperton; a member of the committee named by the Utah State Industrial Commission in 1939 to study occupational disease laws; along with Dr. Louis E. Viko, in 1953 received a presidential citation for outstanding service to the physically handicapped; member of the Bingham District Boy Scout Council and held the Silver Beaver Award; first president of the Bingham Lions Club; for 27 years practiced in Bingham Canyon, where he established his own clinic and 35-bed

hospital; co-founder of the Richards Memorial Medical Foundation, established in November, 1958; for five years served as chairman of its executive committee, and medical consultant at the Memorial Medical Center, where he died Nov. 20, aged 65.

Riley, Benjamin Franklin Jr. @ Thomson, Ga.; Johns Hopkins University School of Medicine, Baltimore, 1903; died Nov. 11, aged 79.

Riordan, Emmett Joseph @ Portsmouth, Ohio; University of Kansas School of Medicine, Kansas City, Kan., 1941; veteran of World War II; resigned from the regular Navy on Nov. 20, 1953; fellow of the American College of Surgeons; associated with Mercy and Portsmouth General hospitals; died in the Veterans Administration Hospital, Huntington, W. Va., Nov. 4, aged 43.

Roose, John Edwin @ Tiffin, Ohio; Western Reserve University School of Medicine, Cleveland, 1946; served an internship and residency at the University Hospitals in Cleveland; at one time a resident at the City Hospital in Cleveland; formerly a captain in the medical corps, Army of the United States; past-president of the Seneca County and North Central Mental Health associations; on the staff of the Mercy Hospital; died Nov. 11, aged 36.

Saunders, Irvine @ Welch, W. Va.; University of Virginia Department of Medicine, Charlottesville, 1937; served as secretary of the McDowell County Medical Society; elected as a member of the House of Delegates from McDowell County in 1952 and again in 1954; for many years superintendent of the Welch Emergency Hospital; formerly associated with the Grace Hospital; died Nov. 28, aged 45.

Scanlon, Thomas Francis @ Norwalk, Conn.; Yale University School of Medicine, New Haven, 1907; fellow of the American College of Surgeons; for many years on the staff of the Norwalk Hospital, where he died Nov. 19, aged 75.

Schwartz, Nathan, Chicago; Loyola University School of Medicine, Chicago, 1917; died in Highland Park, Ill., Nov. 12, aged 74.

Seymon, Max Andre @ Beverly Hills, Calif.; Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Prussia, Germany, 1921; on the staff of Cedars of Lebanon Hospital in Los Angeles, where he died Nov. 1, aged 64.

Seymour, George Alfred @ Elizabeth, N. J.; College of Physicians and Surgeons, Baltimore, 1910; past-president of the Union County Medical Society; served on the staffs of Elizabeth General, St. Elizabeth, and Alexian Brothers hospitals; died in Somerville Dec. 1, aged 71.

Smiles, Clyde Jeffrey @ Ashland, Wis.; University of Pennsylvania School of Medicine, Philadelphia, 1911; affiliated with St. Joseph's Hospital and the Trinity Hospital, where he died Nov. 19, aged 72.

Stamas, Theodore Albert @ Lowell, Mass.; Tufts College Medical School, Boston, 1920; veteran of World War I; served on the staffs of the Lowell General Hospital and St. Joseph's Hospital; died Nov. 22, aged 63.

Stewart, Frank William, Long Beach, Calif.; the Hahnemann Medical College and Hospital, Chicago, 1902; veteran of the Spanish-American War; for many years city health officer; died Nov. 9, aged 80.

Tappan, Edward Arthur @ Paxton, Ill.; University of Illinois College of Medicine, Chicago, 1936; member of the American Academy of General Practice; associated with the Gibson City (Ill.) Hospital and the Paxton Community Hospital, where he died Nov. 1, aged 57.

Taylor, Albert Richards @ Cheyenne, Wyo.; University and Bellevue Hospital Medical College, New York City, 1927; director, division of maternal child health and crippled children, Wyoming Department of Public Health; veteran of World Wars I and II; member of the American Public Health Association and the Association of State and Territorial Directors of Maternal and Child Health; died in the DePaul Hospital Nov. 9, aged 60.

Thomas, Arthur William, Ashtabula, Ohio; Ohio State University College of Medicine, Columbus, 1914; member of the Ohio State Medical Association; past-president of the Mahoning County Medical Society; served as chief of the division of child hygiene for the state department of health in Columbus; later appointed chief of the subdivision of child hygiene in the Cleveland Department of Health; died in the Ashtabula General Hospital Nov. 26, aged 69.

Treadway, W. W., @ Silex, Mo.; St. Louis College of Physicians and Surgeons, 1889; died Nov. 30, aged 92.

Uran, Joseph Alfred, Riceville, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; died in the University Hospital, Iowa City, Nov. 11, aged 81.

Winslow, John Hayes @ Vineland, N. J.; Jefferson Medical College of Philadelphia, 1901; past-president of the Vineland Board of Education; veteran of World War I; associated with the Newcomb Hospital, where he was a trustee, and where he died Nov. 15, aged 80.

Woodul, Thomas W., Pine Bluff, Ark.; College of Physicians and Surgeons, Little Rock, 1907; died in the Davis Hospital Nov. 22, aged 80.

FOREIGN LETTERS

AUSTRIA

Lymphogranuloma.—At the meeting of the Society of Physicians in Vienna on Dec. 5, Drs. G. Brichta and J. Kühböck presented the history of three patients with Hodgkin's disease. The first was a 25-year-old woman with spastic paraplegia in the presence of epidural and vertebral involvement. After laminectomy, roentgen irradiation, and treatment with nitrogen mustard, walking ability was largely restored. The second patient, a 36-year-old man, presented complications such as jaundice due to complete obstruction of the bile flow which responded promptly to nitrogen mustard derivatives and toxic hemolytic anemia which responded well to cortisone. The patient was given maintenance doses of prednisone and has since presented no new manifestations of disease. The third patient had a relapsing miliary pulmonic form of Hodgkin's disease. She reacted promptly to treatment with nitrogen mustard and prednisolone. The most practical therapy and that which gives the longest life expectancy in the treatment of the lymphogranulomatosis consists of a combination of irradiation, cystostatic agents, and cortisone derivatives.

Operations in Diabetics.—At the same meeting Dr. R. P. Königstein stated that diabetic angiopathy occurs frequently in patients in whom diabetes has been present for a long time and should be considered when an operation is contemplated. The danger of the development of thrombosis and embolism in such patients is great. The occurrence of diabetic pseudoperitonitis often results in an erroneous diagnosis of an acute intraperitoneal process in the course of a decompensated diabetic acidosis. Severe dryness of the mouth, pharynx, and larynx associated with dysphagia and hoarseness may lead to the erroneous diagnosis of an acute pharyngolaryngitis especially since the onset may be acute. Diabetic neuropathies, chronic pyoderma, and eczema (especially in the genital region) have often been treated for long periods without any relief because the causative metabolic disturbance has not been recognized. Diabetic patients with chronic diseases such as hernia, cholelithiasis, peptic ulcer, and chronic appendicitis should be operated on when they are free of symptoms and their metabolic condition is favorable.

Dr. R. M. Milczoch reported on a series of 616 diabetic patients with surgical diseases who were treated between 1943 and 1956. Of these 422 were operated on, and of this number 85% were over 50. Of those operated on 18% died, the mortality being highest in those who were operated on because of gangrene. The use of antibiotics and modern methods of anesthesia reduced the postoperative mortality from 29.6 to 14.0%. Massive hemorrhage and obstruction of breathing by occlusion of the respiratory passages or by open pneumothorax are about the only indications which require operation without considering the patient's diabetes. In other emergencies that represent an absolute indication for operation and in which one has an opportunity to carry out the most important investigations and to start an adequate therapeutic regimen for the diabetes, one must differentiate between surgical conditions that lower the glucose tolerance (septic processes, including gas gangrene, obstructive gastrointestinal lesions, and acute abdominal conditions) and those which do not appreciably affect it. Not enough emphasis has been given in the literature to cases of ileus in diabetics but they require the closest possible cooperation between internist and surgeon. The recognition of diabetic pseudoperitonitis is not difficult if it is considered in the differential diagnosis. It is much more difficult in a patient with diabetic coma. Cases of ileus are particularly apt to upset the blood sugar balance in a patient with hitherto controlled diabetes and acidosis may result. The speaker cautioned against being satisfied with a diagnosis of diabetic coma in a patient admitted to a surgical ward. An unrecognized surgical disorder might be the cause of the coma. It is essential to operate early on patients with surgical disorders that lower the glucose tolerance.

FINLAND

Congenital Malformations.—M. E. Takala (*Annales chirurgiae et gynaecologiae fenniae*, vol. 47, supp. 77, 1958) studied 241 families into which one or more congenitally malformed children had been born to determine the influence of genetic and environmental factors on the cause of congenital malformations. An equal number of families with at least two healthy children were also studied. The families with the congenitally malformed children were divided into seven groups according to the nature of the malformation: 102 with a defective

central nervous system, 15 with a defective blood or cardiovascular system, 46 with a defective alimentary tract, 6 with a defective genitourinary system, 55 with defective extremities, 3 with cutaneous abnormalities, and 14 with miscellaneous defects. The mothers who gave birth to congenitally malformed infants amounted to 0.67% of the mothers who gave birth in Turku maternity hospitals. Twenty-one of the families (8.7%) had more than one such child, with a total number of 46 malformed children in these families. There appeared to be a greater number of undefined genetic factors in the relatives of these families than in the other families, and 52% of the families had malformed relatives. The abortion rate for mothers with congenitally malformed infants was $9.4 \pm 1.9\%$ of all their pregnancies, and the percentage of abortions in the control families was only $6.8 \pm 1.6\%$. There were no differences between these two groups in the frequency of marriages between relatives, mentally defective suicides, epileptics, and stillborn children, but a significantly greater number of alcoholics was found among the parents of congenitally malformed children or their relatives than among parents and relatives of families with only healthy children. A greater frequency of congenital abnormalities in the relatives of the former group of parents than in controls was also noted.

The same abnormality occurred more than once in relatives of 25.5% of the families of malformed children and an abnormality of the same defect group in 46.5% of the defect-bearing families. Acute infections occurred at conception or during pregnancy in $19.0 \pm 2.5\%$ of all mothers of defective offspring, in $25.5 \pm 2.8\%$ of the mothers of offspring with a defective central nervous system, and in $14.5 \pm 2.3\%$ of the mothers of offspring of the other groups. Infections of viral and bacterial origin occurred with equal frequency (in $9.5 \pm 1.9\%$ of the mothers). No significant differences were noted between the defect-bearing and control families in the frequency of chronic diseases, operations, traumas, mental diseases, exposure to roentgen irradiation, or ill-effects due to drugs and poisons in the parents or in the frequency of diseases in their environment. The blood group combinations of the parents in the defect-bearing families differed significantly from those of the parents of the control families.

Thyroid Function and Pernicious Anemia.—Forssell and Halonen (*Acta med. scandinav.* 162:61, 1958) described three patients with rare combinations of pernicious anemia and thyroid disturbances. In all these patients the anemia developed several years before any symptoms of thyroid disturbance were observed. In case 2 the diagnosis of pernicious anemia could not be regarded as definite, and the patient's later course showed persistent anemia of the normochrome type, which was almost refractory to treatment. In the first two patients acute thyrotoxi-

cosis developed 10 and 12 years, respectively, after the anemia had been diagnosed. In both the anemia disappeared completely after subtotal thyroidectomy. The observation periods were three and one-half and five years, respectively, and the blood values remained normal without any antianemic therapy. In both a slight, postoperative hypothyroidism developed. In case 1, a vitamin B₁₂ tolerance test showed normal resorption at the end of the period of observation. In case 3, spontaneous hypothyroidism developed two years after an anemia of definitely pernicious type had been diagnosed. No obvious change in the course of the anemia was brought about by the hypothyroidism, nor by adequate thyroidin treatment, although this caused euthyroidism. After 20 months with normal blood values and with the patient under liver and thyroidin medication a vitamin B₁₂ tolerance test still yielded a pathological value of 0.2%.

Endogenous Clearance Values.—The serum creatinine and urea content were determined in 90, the serum indican in 80, and the uric acid in 50 patients with renal disease by A. Kasanen and co-workers (*Nord. med.* 60:46, 1958). These values were compared with the respective clearances. There was a highly significant correlation between the serum creatinine, urea, and indican concentrations and the clearance tests. In the uric acid group this correlation was barely significant. In an unselected series of patients with renal insufficiency verified by clearance tests serum creatinine determination was non-diagnostic in 6%. The respective figures for serum urea were 10%, for indican 3.5%, and for uric acid 26%. According to the authors it is of no value to use endogenous clearance tests if the concentrations of creatinine, urea, indican, and uric acid in the serum are not normal.

Reserpine-Resistant Hypertension.—Juha Hakkila gave 30 patients a combined reserpine and oxamethonium (a bisquaternary ammonium compound and effective ganglion-blocking agent having relatively few side-effects) therapy as their blood pressures did not respond sufficiently to reserpine alone. The mean 24-hour dose of oxamethonium varied between 0.625 and 1.075 Gm. (*Ann. med. int. Fenniae* 47:137, 1958). The mean period of observation was 4.4 months. The results obtained and the complications developing in connection with the treatment corresponded to those previously noted in the treatment with ganglion-blocking agents. The most common side-effects, constipation and dizziness, were mild and did not prevent the use of oxamethonium in the ambulatory treatment of hypertension.

Postoperative Lung Volume and Function.—T. M. Scheinin (*Annales chirurgiae et gynaecologiae Fenniae*, vol. 47, supp. 78, 1958) studied the alterations in lung volume and function during the first 20

days after intrathoracic operations in 66 patients and the first 10 days after high laparotomy in 33. Of the first group 17 underwent thoracotomy without removal of lung tissue, 28 underwent procedures ranging from segmental to bilobar resection, and the remaining 21 had pneumonectomies. The operations were generally accomplished under light inhalation anesthesia with muscle relaxation and controlled breathing. The various subdivisions of lung volume and the maximal breathing capacity were measured by means of closed spirometer circuits, and helium in air was used to determine the functional residual capacity. The minute-volume of breathing and derived measures were obtained by use of gas meter. The end-tidal gas was analyzed for oxygen and carbon dioxide by a micromethod. Various procedures were used in a series of 21 patients for relief of postoperative pain.

Thus at the conclusion of the operation polythene cannulas were inserted into the surgical incision for induction of regional analgesia with lidocaine solution, and in a number of patients morphine hydrochloride was given intravenously in a dose of 10 mg. per kilogram of body weight. Before operation the numerical differences in the volumetric and other data in the thoracotomy, lung resection, and pneumonectomy groups were slight and without statistical significance. A comparison between the measured values for lung volume and the calculated normal values showed likewise comparatively small preoperative differences between the groups. During the first 20 days after intrathoracic operations the values for total lung capacity and its various subdivisions were much reduced. The decrease was most pronounced in vital capacity and slightly less marked in total lung capacity, whereas a more moderate fall was noted in functional residual capacity and residual volume, and residual volume as the percentage of total lung capacity was increased. The greatest deviations from the preoperative level were observed two days after operation and later examinations showed a gradual return to the preoperative values.

Postcholecystectomy Syndrome.—O. Heinivaara and co-workers (*Ann. med. int. Fenniae* 47:155, 1958) reported a series of 68 cholecystectomized patients with persistent abdominal distress after the operation. In addition to the routine examinations intravenous cholangiography was obtained on all patients. These examinations showed that in 44 patients the symptoms were derived from the biliary passages, and of these 4 had stones in the common bile duct. In 24 the underlying cause was found to be some other abdominal process such as ulcer or cancer. In patients with postcholecystectomy syndrome as the cause of their symptoms the findings on intravenous cholangiography were pathological in 78%. Cholangiography assisted in making the diagnosis of postcholecystectomy syndrome. In ad-

dition, intravenous cholangiography made it possible in many cases to decide whether the symptoms were due to biliary dyskinesia, a common duct stone, some other organic obstruction in the biliary passages, or a stump of the cystic duct. The clearing up of this question was of prime importance in deciding on surgical or conservative treatment.

INDIA

Intestinal Tuberculosis.—A. K. Dutta Gupta studied a series of 25 patients with intestinal tuberculosis (*Indian Journal of Surgery*, vol. 20, October, 1958). Of these, 14 were of the hypertrophic variety, the ileocecal region being involved in 13 and the rectosigmoid in 1; 4 of these had also bilateral involvement of the lungs and in 1 there was an associated genital tuberculosis with a "frozen abdomen." Five were of the ulcerative variety, the ulcers in the jejunum in three, in the jejunum and ileum in one, and in the anus in one; unilateral pulmonary tuberculosis was present in one and bilateral in two of these. Combined hypertrophic and ulcerative lesions were seen in three patients; in two the ileocecal region and ileum were involved and in one the ileocecal region and the transverse colon were affected; there was no pulmonary involvement in any of these cases. The sclerotic or fibrous variety was present in three, the ileum being the site of disease in all; one of these showed evidence of bilateral pulmonary tuberculosis. The common clinical features in hypertrophic and combined types were pain and swelling in the right iliac fossa. Fever and vomiting were common, constipation, loss of appetite, and borborygmi being some of the other complaints. Those with the ulcerative type more frequently complained of epigastric pain, vomiting, constipation, and visible gastric peristalsis simulating pyloric stenosis. Those with the fibrous type had diffuse abdominal pain, vomiting, distention, and visible peristalsis with the step-ladder pattern. The youngest patient in this study was 11 and the oldest 65. About 19 had symptoms extending up to two years. All had a moderate degree of anemia. The leukocyte count varied within normal limits with lymphocytosis in one patient. The sedimentation rate was raised in 20 patients, ranging between 32.5 mm. and 140 mm. (Westergren).

Gastric lavage and stool examination for tubercle bacilli gave negative results. The tuberculin test with 1:100,000 strength gave a positive reaction in 7 of the 10 patients on whom it was performed. No sputum was positive in two cases. Radiologic examination of the hypertrophic variety showed a filling defect in the cecum, in some associated with a filling defect in the ascending colon with an altered ileocecal angle or marked delay in emptying of the ileocecal region; or nonfilling of the

cecum, ascending colon, and hepatic flexure. The ulcerative type showed dilated stomach and duodenum followed by obstruction or a certain amount of delay of the the barium in the second part of the duodenum, with narrowing at the level of the crossing of the superior mesenteric vessels. The fibrous type with stricture showed dilated loops of small intestine with narrowing in places and stasis. Preoperative antitubercular treatment was given to all patients for three to nine weeks. Those with active pulmonary infection had only antitubercular treatment except one with ulcerative variety whose vomiting persisted although the lungs cleared up. Ileocelectomy was performed on nine patients with the hypertrophic variety, the extent of the ileum resected depending on the extent of ulceration. The one-stage operation was preferred. A short circuit was performed in the hypertrophic lesion of the rectosigmoid, the ileum being joined to the upper rectum. Gastrojejunostomy was performed on two patients with the ulcerative variety simulating pyloric stenosis. An ileoileostomy was performed on two patients with stricture and an ileotransverse colostomy on one.

There were two deaths; one occurred three years after operation, during which time the patient was in good health. Death was due to volvulus of a loop of small intestine with strangulation and perforation. The other death, one week after operation, was due to a pulmonary complication following operation; 14 were in good health without symptoms and with gain in weight and improvement of the anemia. The patient with rectosigmoid involvement complained of occasional heaviness in the lower abdomen with passage of mucus in the stools but no evidence of a protozoal or helminthic infection. Histopathological study in nine patients with ileocelectomies showed no caseation which might be due to adequate preoperative antituberculosis treatment. Lymph nodes showed typical tuberculous lesions with caseation in 10 patients. Culture for tubercle bacilli from scrapings of the cecal wall gave negative results and that from lymph nodes showed only one positive result.

Treatment of Coronary Insufficiency.—P. K. Sen (*Indian Journal of Surgery*, vol. 20, October, 1958) subjected five men varying in age from 36 to 67 years and with severe to moderate angina of effort of typical character and distribution to bilateral ligation of the internal mammary arteries to overcome the coronary insufficiency. One patient gave no clear history of myocardial infarction but all the rest had had one to four attacks before operation. In all of them the anginal element was predominant, a few steps being enough to produce pain. Local procaine infiltration supplemented by a small amount of thiopental or meperidine intravenously was the anesthesia of choice. The second interspace was usually chosen for approaching the

artery. The identification and localization of these vessels was not always easy. No effort was made to dissect the vein from the artery. Serial electrocardiographic checks in the postoperative period are important as postoperative pain may hide a new cardiac infarct. A routine postoperative scout film of the chest was taken on the third and fourth postoperative day. The longest follow-up was about four months and the shortest six weeks. In all a marked increase in the sense of well-being and fitness was noticed. The anginal pains disappeared in all after operation. There were no significant electrocardiographic changes after operation.

Atomic Age Hygiene.—India started training her own physicists and those of southeast Asia in health physics, or the health aspects of radiation and atomic energy in November. The training will enable them to protect personnel directly involved in the use of atomic energy for peaceful purposes. The course was jointly organized by India's department of Atomic Energy and the World Health Organization with the cooperation of the U. S. Atomic Energy Commission. Over 20 physicists from India, Australia, China, Japan, Indonesia, the Philippines, and Thailand participated in the six-week course. The participants are expected to constitute a nucleus for future training of technicians in the safety aspects of atomic energy in their respective countries. The air monitoring division had established seven sampling centers in the country for obtaining samples of airborne dust, rain, and settled dust for radioactive measurements. A number of monitoring stations had been established in Bombay to estimate the general level of radioactivity in this area. In order to check the possible spread of contamination to the environment of any atomic plant or reactor, periodic radiation surveys of the soil, plants, insects, fish, and other organisms were conducted by the division.

Oxytetracycline in Preoperative Preparation.—DeSa and Gandhi (*Indian Journal of Surgery*, vol. 20, October, 1958) stated that the efficacy of antibiotics in promoting growth and elevating serum protein levels has attracted much attention in recent years. They studied the effect of oxytetracycline on lowered serum protein levels in a selected group of orthopedic patients. These patients suffered from such chronic bone and joint disorders as paraplegia with joint deformities, old fractures, and arthritis of the spine. None of them had any important source of protein depletion such as bed sores or abscesses. All were taking the hospital diet, were free from gastrointestinal disorders, and had normal hematocrit readings and normal liver function. They were studied in groups of two or more, one of each group serving as a control. Blood proteins were estimated initially and on two subsequent occasions at an interval of 15 days. A total of 15 pa-

tients were thus observed. In the first three series of three patients each, one received 25 mg. of testosterone propionate intramuscularly on alternate days for one month; another was given 50 mg. of oxytetracycline by mouth daily; and the third served as a control. The testosterone was dropped in the later series as it did not produce any significant rise in the serum protein level. The total plasma proteins were estimated by the specific gravity method and the serum albumin and globulin were estimated by paper electrophoresis. The vegetarian diet contained 78.6 Gm. of protein (19.2 Gm. from animal sources), 74.2 Gm. of fat, and 379.8 Gm. of carbohydrates and yielded 2,501 calories. The nonvegetarian diet contained 80.5 Gm. of protein (27.7 Gm. from animal sources), 74.2 Gm. of fat, and 355.5 Gm. of carbohydrates and yielded 2,418 calories. A consistent elevation of serum proteins was noticed in all the patients except two, with the use of oxytetracycline. In most, the total protein had risen in amounts varying from 0.1 to 0.8 Gm.%. Thus a positive effect in improving the protein content of the blood including albumin was obtained with this antibiotic.

Coarctation of the Aorta.—P. K. Sen (*Indian Journal of Surgery*, vol. 20, October, 1958) observed 10 patients with congenital coarctation of the aorta, 7 being above the age of 20, the oldest being 35, and one being a child of 3. Most of them came to the hospital only at the onset of severe symptoms and often with left ventricular failure. Most of them had dyspnea on exertion; three had headache and giddiness; two complained of cramps in the legs; and one patient, aged 22, had no symptoms and therefore refused operation. Six showed evidence of enlargement of the heart involving the left ventricle, while in two children the right ventricle was enlarged. All showed evidence of collateral circulation, including the child of 3 who had superficial vessels coursing all over the thoracic and abdominal wall. Five of the seven above the age of 20 had definite rib notching, which sign was absent in younger patients. All had hypertension which was, however, variable. Angiography for diagnostic purposes was performed on 5 patients and 5 of the 10 patients were operated on, with two deaths. Resection of the coarctation with end-to-end anastomosis was performed on three, wedge resection of the coarctation on one, and excision of the coarctation with homografting on one.

One of the operative deaths was due to cardiac arrest in a 10-year-old child, which occurred on releasing the distal clamp after completion of excision of the coarctation and end-to-end anastomosis. The arrest was probably due to anoxia; heart action returned within six minutes after cardiac massage but death occurred six hours later. The second death was due to a late secondary leak from the suture line and the formation of a false

aneurysm which ruptured into the pleural cavity 46 days after operation. The author stressed adequate exposure with multiple rib resections if necessary. For a better mobilization of the coarcted segment, more intercostal vessels may be sacrificed, as adequate excision is most important. Interrupted suture was used for children and continuous sutures for patients over 15. Wedge resection may have to be performed in difficult situations, as in the case of a child in whom an adequate aortic pathway was restored after the resection with a good femoral pulse and a normal arm-leg pressure gradient. The clamps should be released slowly, the distal being released first. Postoperative heparinization was not done in these patients and was not found to be necessary or desirable. A suitable graft was always kept ready in case grafting became necessary after excising the affected segment. Three patients have done well after operation, including the one in whom a homograft replacement was performed.

ISRAEL

Health Service for Bedouins.—An eight-room central clinic for the Bedouins of the Negev was opened in Beersheba. Two physicians and a staff of nurses will be available to attend to the patients, who will come from all the Bedouin tribes in the area. There are about 14,500 Bedouins in the Negev, divided into 18 tribes and inhabiting an area of about 1,100 sq. km. to the east and south of the city of Beersheba. The Ministry of Health initiated a health service for the Bedouins in 1949. The medical services were organized under the supervision of a doctor and a nurse. Later two young Bedouins were trained as orderlies and two girls also helped, but in spite of all efforts no additional candidates could be found. In addition to Beersheba, there are now clinics for Bedouins at Um-Batit, El el Malach, and Sakib. The number of patients is growing yearly. It was 7,440 in 1956; 9,638 in 1957; and 10,307 in 1958 (up to the end of November). Although some tribesmen attend regularly, others do not appear at all. Some go to private doctors or dervishes, of whom there are many. Some of the latter use Arab remedies, such as making burns on the skin above the site of the pain, and others make and sell amulets. At the clinic, at first the Bedouins were treated free, but at the end of 1955 a charge of about 25 cents per visit, including medicines, was instituted. Since June, 1958, the charge has been fixed at about 50 cents. Patients who are unable to pay are treated free.

Tuberculous patients are hospitalized free of charge, adults being accommodated at the Hospital for Lung Diseases in Nazareth, and children at the Eitanim Hospital near Jerusalem. The clinic main-

tains close contact with the Hadassah Hospital in Beersheba, where many Bedouins attend the clinics and are accepted for hospitalization. A few women now have their children in the hospital. The Bedouins must pay for maternity services. Bedouins visit the eye, skin, and ear, nose, and throat specialists at the Kupat Holim Central Clinic. Whenever necessary, they are accepted at government hospitals. The commonest disease among them is tuberculosis. In 1957, 4,200 Bedouins were inoculated against smallpox. In the same year parents were asked to bring their children for inoculation against poliomyelitis; 50% of the children of the ages eligible for inoculation received the first injection, and 25% were brought for the second. In 1958, 1,760 children were inoculated against poliomyelitis, 70% of those eligible receiving one injection and 50% receiving two.

Health Conditions in Israel.—During the fourth meeting of the World Jewish Medical Association which took place in Israel in August, S. Btsh, Director General of the Ministry of Health, said the development of health services in Israel must be viewed against the background of a multiplicity of factors, the most important of which are the development of voluntary health agencies during the Mandatory period, the law of the return giving every Jew in the world the right to immigrate to Israel; the advent of mass immigration during the years 1948-1952; the nonselective character of this immigration; and the influx of a large number of Jews from underdeveloped countries. The state of health of the Jewish population at the end of the Mandate was fairly good. The infant mortality for the Jewish sector was 29.2 per 1,000 live births and the crude death rate was 6.4 per 1,000. With the influx of immigration the country was faced with the introduction of a large number of disease-carriers and of persons susceptible to such diseases as tuberculosis and poliomyelitis. The lower standard of living, the lack of proper housing, and the ignorance of the immigrants in matters of hygiene resulted in a deterioration of the health of the people, culminating in a rise of infant mortality and crude death rates, and the spread of tuberculosis, poliomyelitis, and malaria.

Intensive health measures resulted in effective control of most of these conditions, with the result that at the end of the 10-year period the health conditions of the country compared favorably not only with those of the pre-1948 period but also with those of many prosperous and progressive countries. The infant mortality in 1952 was about 32 per 1,000 live births, life expectancy at birth was about 70 years, maternal mortality dropped to 0.63 per 1,000 live births, tuberculosis morbidity reached the low figure of 5.7 per 10,000, and tuberculosis mortality was only 6.1 per 1,000,000. Malaria

has been practically eradicated and an intensive vaccination campaign has succeeded in reducing greatly the incidence of poliomyelitis. The number of physicians in the country is about 1 for every 450 inhabitants and the ratio of general hospital beds is about 3 per 1,000 inhabitants.

Myocardial Infarction and Serum Lipids.—At the same meeting D. Brunner and J. Agmon reviewed the differentiation in the various Jewish groups of population—especially Yemenites—concerning atherosclerosis, nutritional status, and myocardial infarction. After the large immigration involved in "Kibbutz Galuyoth," the population now contains Ashkenazic Jews, who have a high incidence of coronary artery disease in middle age as occurs in the western world. On the other hand there are the Yemenite Jews, who are practically free from atherosclerotic heart disease and angina pectoris in middle age. In chemico-analytical and in paper-electrophoretic investigation it was found that the absolute level of β -cholesterol in milligrams per 100 cc. and the relative per cent of α -cholesterol were the best indexes of atherogenic activity. β -cholesterol is the lipid fraction that migrates in the electrophoretic field with the β -globulins, belonging also to the β -lipoproteins. The analysis of the various lipid fractions on 74 patients with myocardial infarction showed that 40% had less than 250 mg. per 100 cc. of cholesterol (upper limit of normal). This resulted in the overlap which is always seen in comparisons of coronary patients and healthy subjects. Only 10.8% of the patients examined had a β -cholesterol level of less than 180 mg. per 100 cc. This level of β -cholesterol distinguishes more clearly between coronary patients and healthy subjects than the total cholesterol level and markedly reduces the overlap.

In the present study none of 32 Yemenite farmers had a level of β -cholesterol over 180 mg. per 100 cc. Values less than this were believed to exert a "protective" effect with regard to coronary artery disease. This relatively high level of β -cholesterol even in patients whose total cholesterol was within normal limits (less than 250 mg. per 100 cc.) was due to the fact that in patients with coronary disease only a small fraction of the cholesterol moved with the α -lipoproteins on electrophoresis. In 94 patients with myocardial infarction the average percentage of α -cholesterol was 14 ± 3.13 . In the Yemenites 27% of the total cholesterol was bound to the α -globulins (in spite of the low level of total cholesterol in this group). Thus among the Yemenites the percentage of α -cholesterol was nearly double that of patients with coronary disease and also 33% higher than the α -cholesterol percentage in the healthy Ashkenazi. The absolute values of α -cholesterol in milligrams per 100 cc. were similar in all the healthy and nonhealthy men investigated

in the Ashkenazi as in the Yemenite groups. This finding showed that the lipid changes nearly always occurred in the β -lipoprotein fraction. The failure of studies in America to distinguish by lipid pattern between persons with and without coronary artery disease might be due to the fact that subjects without evidence of coronary artery disease might have undergone subclinical atherogenesis. Hence, only by using control groups known to be free of coronary artery disease, such as Yemenites, is it possible to demonstrate real differences between the lipid patterns of normal persons and those with coronary artery disease.

Urolithiasis.—At the same meeting A. de Vries reported the incidence of urolithiasis in 12 settlements, selected because of different climate and ethnic composition. The incidence was high—11.8% (14.4% in men and 8.8% in women) and ranged in the various settlements from 1.6 to 34.1%. It was highest in the hottest and lowest in the coolest regions, higher in immigrants from Europe than in those from the Middle East and northern Africa, low in those born in Israel and immigrants below the age of 18, and rose sharply with the attainment of that age. In most of the patients, the urolithiasis developed within the first five years after arrival in the country. It was rare in recent immigrants. Of the various factors commonly implicated in the cause that of low urine output, due to inadequate fluid intake not adapted to heavy extrarenal fluid loss, furnished the most comprehensive explanation of the observations made. Ethnic differences in incidence could be explained by differences in fluid intake, largely determined by transfer of drinking habits of the immigrants from their countries of origin.

West Nile Fever.—At the same meeting N. Goldblum said that although West Nile virus has been known for almost 20 years, the clinical manifestations evoked by it and its epidemiology have remained unknown for a long time. In the last five years, extensive investigations have been made on the epidemiology, immunology, and pathogenic role of this virus in Israel. West Nile virus has been shown to be the cause of a benign specific short-term fever occurring in epidemic form. The virus was isolated in many instances from the blood of patients with "fever" and a rise in specific antibodies was demonstrated. Thus, a new clinical entity was described and named "West Nile fever." The outstanding features of the disease in typical cases are: fever, glandular swelling, and a skin rash. The clinical spectrum seems to be wide, ranging from a mild abortive illness to severe encephalitis. Neurological involvements are usually mild and infrequent, but in a recent outbreak 12 aged patients with severe encephalitis were shown to

have West Nile fever. Homologous complement-fixing and neutralizing antibodies develop shortly after the onset and immunity is probably lifelong.

During convalescence, heterologous antibodies develop to Japanese and St. Louis encephalitis viruses. Laboratory diagnosis is based on the isolation of the virus from the acute phase blood sample and/or the complement-fixation test. The epidemiology of West Nile fever in Israel is not altogether clear. The outbreaks exhibit a well-defined and regular seasonal incidence, being confined to the late summer months. They occur along the Mediterranean shore in delineated geographical areas, which constitute permanent foci of infection. The disease is transmitted to man by culicine mosquitoes. In Egypt, pigeons and crows were found infected with the virus. It may be assumed that the main cycle in nature is through mosquitoes and birds and the disease in man is an incidental infection.

UNITED KINGDOM

Shortage of Midwives.—There is a shortage of midwives both in hospitals and for domiciliary confinements. For the past 16 weeks the busy maternity unit at Park Hospital, Davyhulme, Manchester, had over half its beds closed because it could not obtain sufficient midwives. At other maternity hospitals whole wards were closed for the same reason. For the Manchester region, with its nearly 2,000 lying-in beds, the total establishment of available certified midwives is 664 and only 75% of the posts are filled. The Minister of Health is to receive a deputation from the Regional Hospital Board, the United Manchester Hospitals, and the Manchester City Council to discuss the hospital maternity service and to press for funds to build a new large maternity unit and smaller units for confinements conducted by general practitioners. The shortage of midwives is general throughout the country, although more acute in the north than in the south. Many units have closed in Sheffield, where a new maternity hospital remains unopened because of this shortage.

Domiciliary midwifery is also suffering from the shortage. The Working Party on Midwives recommended that no domiciliary midwife should be responsible for more than 55 deliveries a year, and the Royal College of Midwives compromised with 60, but in many areas the midwives are handling 100 or more deliveries a year. At present, a state registered pupil midwife receives \$854 a year, less \$345 deductions for accommodation. In general nursing she would earn \$260 a year more. There is, however, apparently no shortage of pupil midwives. The shortage is in trained midwives who remain in practice. Within three years of qualification more than 70% of the 5,000 that are trained annually stop practicing. The hospitals are meeting the shortage

by discharging mothers and babies earlier, in some places on the seventh day. This throws additional strain on the few remaining hospital midwives. A scheme for delivery in hospital or in the patient's home under the care of a domiciliary midwife is being considered.

Richard Bright Centenary.—The centenary of the death of Richard Bright (1789-1858), the first scientific investigator of renal disease, was celebrated recently. His hospital, Guy's of London, marked the occasion by a combined round and the Bright Memorial Lecture, given by Prof. Max Rosenheim of University College Hospital. Bright was an Englishman who qualified as a doctor in Edinburgh in 1813. In 1820 he was elected assistant physician and in 1824 full physician to Guy's Hospital. In his "Reports of Medical Cases" in 1827 he linked proteinuria and edema causally with pathological changes in the kidney. Two papers on what has since been called Bright's disease appeared in 1836 in the first volume of *Guy's Hospital Reports*. Professor Rosenheim spoke of the advances since the days of Bright, when the coagulability of urine was demonstrated by boiling in a spoon. He compared this with the present-day pressurized column chromatograph, which identifies the amino acids in urine. He regretted that the term Bright's disease has persisted, because it describes what is in reality a group of syndromes. There is no close correlation between disordered function and pathological findings. Many of Bright's patients probably had the nephrotic syndrome.

Inadequate Sterilization.—The Nuffield Provincial Hospitals Trust studied the practice of sterilization in hospitals. The chairman of the advisory panel, Dr. J. Revans, said that this was the first phase of the trust's project on the organization of central sterile supply departments. In the last 14 months an operational research team appointed by the trust investigated the sterilizing methods used in a number of hospitals, including a London teaching hospital, and found that in all of them the methods used were defective. Imperfect sterilization may be one of the factors responsible for the high incidence of infection in hospitals today. The chief defect was inadequate staff to deal with the sterilization of instruments and dressings. The highest standard of aseptic technique was shown at a small hospital with few staff changes and an adequate, well-trained staff. Sterilizers, particularly when gas-operated, were not always satisfactory and were sometimes poorly maintained, as was much of the equipment placed in them. Drums used for the sterilization of towels, dressing, and gowns were often damaged, lined with unsuitable material, or packed so tightly that steam could not circulate. Of

the supposedly sterile articles 18% were found not to be sterile. Generally speaking, sterilization techniques were better in the operating rooms than in the wards. This was attributed to better equipment and maintenance, and to the staff in the operating room being more aware of the importance of sterilization than the ward staff. Some operating rooms had leaking roofs and were infested with cockroaches. Of 17 autoclaves tested only 9 were working satisfactorily; 4 were unsatisfactory, and 4 were of doubtful efficiency. The chief cause of inefficient autoclaves was unsatisfactory working by personnel, who lacked supervision and were often not correctly trained. Such personnel are responsible for the sterilization of gloves, gowns, dressings, and other equipment, yet their pay is less than that of a doorman. The investigators recommended that hospital pathologists or bacteriologists carry out periodic tests on the effectiveness of autoclaves in hospitals.

Serum Glutamic Oxalacetic Transaminase.—A survey of 129 patients with suspected myocardial infarction by Keele and co-workers showed that the serum glutamic oxalacetic transaminase (SGO-T) level is almost always raised between 24 and 48 hours after a myocardial infarct (*Lancet* 2:1187, 1958). Of 75 attacks of pain proved to be due to this lesion at autopsy or by the appearance of pathognomonic electrocardiographic changes, only 2 were associated with an SGO-T level of less than 50 units during this period, an incidence of less than 3% false-positive results. The height of the SGO-T level at its peak was closely related to the prognosis. In eight of nine cases diagnosed as myocardial infarction an SGO-T value of over 300 units was associated with early death. Of 20 with a value between 200 and 300 units, 8 developed heart failure or a fall of systolic pressure below 100 mm. Hg, and 5 died within a month. Of those with an SGO-T level under 200 units, 23% developed heart failure and 5% died. Since most of the deaths were due to heart failure, these figures confirm clinically the experimental finding that the maximum level of SGO-T is related to the mass of muscle infarcted. Anginal pain at rest with an abnormal but not diagnostic electrocardiogram and a raised SGO-T level was found to carry the same prognostic significance as infarction proved by electrocardiography. Other conditions occasionally given rise to chest pain and a raised SGO-T level. Thus a false-positive test was found in 7 of 104 patients with a raised SGO-T level. A raised SGO-T level in a patient with an abnormal but nonspecific ECG carried the same prognostic significance as diagnostic changes in the Q and T waves. Even if the ECG shows no significant departure from the normal, a raised SGO-T level may indicate myocardial infarction.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Asthma and Diabetes. E. Helander. *Acta med. scandinav.* (no. 3) 162:165-174, 1958 (In English) [Stockholm].

The author investigated the concurrence and the antagonism of diabetes mellitus and of bronchial asthma in a series of patients with either one or both diseases. Bronchial asthma was present in 3,151 patients and diabetes mellitus in 3,236. Thirty-six patients, most of whom were over 40 years of age, had both diseases simultaneously, with approximately the same incidence in terms of percentage of diabetes mellitus in patients with bronchial asthma (1.14%) as that of bronchial asthma in patients with diabetes mellitus (1.10%). The concurrence of both diseases appeared to be more common among women than among men. The incidence of diabetes mellitus in patients with bronchial asthma was much more frequent among those over 60 than among younger patients. There was a gradual increase in the incidence of diabetes mellitus among patients with bronchial asthma correlated with an increase in age, whereas the incidence of bronchial asthma among patients with diabetes mellitus was fairly equally distributed during the various periods of the life span. Both diseases were of a mild type when simultaneously present. Bronchial asthma was of an intrinsic nature, the specific allergy not being the precipitating factor in any instance. Asthmatic episodes were mild in most patients and were moderately severe in the remainder, being related to the respiratory tract infections. Of the patients who had diabetes mellitus as the main disorder, insulin was taken continually by 3 young patients and occasionally by 2. The remaining patients had a mild form of diabetes mellitus, and a slight or moderate abstinence from carbohydrate intake was the only treatment necessary. Administration of corticotropin (ACTH) induced or exacerbated an already existing state of diabetes mellitus in 2 patients. The onset of bronchial asthma was followed in some

patients by the diminution of symptoms of a pre-existing diabetes mellitus; an analogous process took place with the onset of diabetes mellitus in some patients with bronchial asthma. Administration of insulin in small doses exacerbated the symptoms of bronchial asthma in some patients with diabetes mellitus. Asthma episodes were not accompanied by alterations in the blood carbon-dioxide-combining power or the blood glucose level.

Most workers who have studied the concurrence and the antagonism of diabetes mellitus and bronchial asthma observed that the concurrence of both diseases was lower with respect to the population as a whole than the incidence of each disease taken separately. They concluded that the 2 diseases were antagonistic. The results of this study, however, show that such disparity does not exist, because the concurrence of both diseases is similar to the incidence of each with respect to the population as a whole.

Spontaneous Strokes in the Young. H. Stevens. *Ann. Int. Med.* 49:1022-1034 (Nov.) 1958 [Lancaster, Pa.].

The author reports on 32 healthy normotensive young persons, between the ages of 5½ and 45 years, in whom cerebrovascular accidents, characterized by acute hemiplegia and other focal neurological manifestations, occurred in the last 7 years. The patients were seen in private neurological practice; all of them were ambulatory and active, and most were white-collar workers representative of the population of Washington, D. C. None of the patients had traumatic, neoplastic, infectious, embolic, or other primary disease. Although the precise causative mechanism was not always established, 2 large categories of strokes in the young persons could be recognized, namely, those due to cerebral venous thrombosis and those due to cerebral arterial thrombosis. The first group consisted of 2 children with infantile hemiplegia, 12 women with puerperal hemiplegia, and 2 women with venous thrombosis of pregnancy. The other group consisted of 16 adults, 11 of whom were men, and some had thrombosis of the carotid artery. The diagnosis of the latter condition can often be made by clinical observation, including a history of acute onset of headache with contralateral hemiplegia, and ipsilateral Horner's syndrome. Palpation of the carotid artery and ophthalmodynamometry are valuable, but not infallible, techniques that deserve more frequent usage. Arteriography is often indispensable, particularly in excluding intracranial

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aneurysm or tumor, but it is often possible to avoid unnecessary, painful, or dangerous tests by careful analysis of the clinical data. None of the patients died, and residuals were uncommon. None has shown electrocardiographic changes or other evidence of progressive vascular disease. Only 2 of the 16 patients received anticoagulant therapy. Anticoagulants were not used in the 12 women with puerperal hemiplegia due to cerebral venous thrombosis. None of them died, and sequelae were rare.

Unfamiliarity with spontaneous strokes in young persons may lead the perplexed clinician to subject the patient to a series of elaborate tests to identify the elusive cause. Syphilis and hypertension are readily eliminated. Brain tumor, collagen disease, and congenital and acquired diseases of the vascular and hematological systems are then considered. The multiple tests necessary to investigate these various possibilities are usually negative, but the time consumed is often sufficient to permit spontaneous improvement. An erroneous diagnosis of multiple sclerosis is then often made by exclusion. Most spontaneous (arterial) strokes in healthy young persons are due to solitary atheromatous plaques similar to those observed in older patients. Stress seems to precipitate the attack in some cases, since in the series reported there was a definite history of acute stress in 5 men, and 1 woman had been under chronic duress for several months before her stroke occurred.

Development of a rational therapeutic program rests on accumulation and assessment of further data, especially on pathogenesis. The usefulness of anticoagulants in the treatment or prevention of a stroke requires further validation. Prognosis in these selected patients was generally good with no specific treatment. The indiscriminate use of anticoagulants without proper refinement of the heterogeneous diagnosis of stroke is hazardous. Increased bleeding into a hemorrhagic infarct is a particular danger.

Relationship Between Chronic Bronchitis and Bronchial Carcinoma. E. Gyurech-Vágó and M. Scherrer. *Schweiz. med. Wchnschr.* 88:1132-1136 (Nov. 8) 1958 (In German) [Basel, Switzerland].

The authors report on 126 patients who were studied at the medical clinic of the University in Bern, Switzerland, with regard to pulmonary disorders preceding the onset of carcinoma. A history of a type of pulmonary disease other than carcinoma was elicited from 81 (64%) of the 126 patients. There were 33 patients (26%) with recurrent pneumonia, pulmonary tuberculosis, pleurisy, or trauma of the chest. Forty-eight patients (38%) had been affected with chronic bronchitis for many years, and 14 of these (11% of the 126 patients) had a definite history of bronchial asthma, which

occurred before the bronchial carcinoma. Considerable depression in expiratory movements was revealed by respiratory function tests in 107 patients (85% of the 126 patients), with symptoms of diffuse bronchiolar obstruction which may have explained this depression. In 85 patients (65% of the 126) bronchial spasm was present.

The increased incidence of a history of bronchitis and of asthmatic symptoms in patients with bronchial carcinoma is remarkable. It suggests that, in contrast to the general opinion, bronchial asthma should not be interpreted exclusively as symptomatic of bronchial carcinoma (so-called associated asthma). A decisive causative correlation may be considered between bronchial asthma occurring in bouts or chronic asthmatic bronchitis (different from the so-called smokers' catarrh caused by excessive use of nicotine) and bronchial carcinoma.

The Treatment of Acute Leukemia in Adults. K. D. Kittleson and H. L. Alt. *Quart. Bull. Northwestern Univ. M. School* (no. 4) 31:353-361, 1958 [Chicago].

The authors report on 24 adult patients with acute leukemia, who were treated in Chicago at the Veterans Administration Research Hospital between February, 1955, and June, 1956, and at Passavant Memorial Hospital between April, 1952, and August, 1957. Patients in the terminal acute phase of chronic leukemia were excluded. The diagnosis of acute leukemia was confirmed by the finding of large numbers of blast cells and pro cells in the bone marrow before treatment in all patients except one. In this one patient repeated attempts at bone marrow aspiration were unsuccessful, and a bone marrow biopsy showed myelofibrosis. The diagnosis of acute leukemia, based on peripheral blood and clinical findings, was confirmed at autopsy. The group included 20 men and 4 women, ranging in age from 22 to 77 years, the mean age being 47.5 and the median 49.5 years. Although no standard treatment program was followed, certain general principles were adhered to in most cases. Transfusions were given only when necessary to keep the hemoglobin concentration above 7 Gm. per 100 cc. Antibiotics were given for infections and occasionally prophylactically during periods of pronounced leukopenia. Eleven patients were treated with mercaptopurine and steroids alone; 10 were treated with these 2 factors plus folic acid antagonists (9 with Aminopterin and 1 with Amethopterin); and 3 were treated with the 3 factors plus nitrogen mustards.

Complete remissions, excluding the bone marrow, were achieved in 9 of the patients, and complete or partial remissions in 13. The complete remissions averaged 16 weeks in duration, and the partial remissions, 10.6 weeks. The median survival time after onset of the disease was 8 months. The most important factor affecting the outcome of

therapy appears to be age, the poorest results being obtained in patients over 50 years of age. Patients in whom the disease had been present for less than 2 months tended to respond better to treatment than those in whom it had been present for longer periods. The complications of treatment were essentially those of prolonged steroid therapy, the major ones being infection and gastrointestinal tract ulceration.

Echinococcus Disease in the United States. A. M. Katz and C. Pan. *Am. J. Med.* 25:759-770 (Nov.) 1958 [New York].

The authors collected from the United States literature 556 cases of echinococcal infection which had been reported between 1822 and 1956. Most of these cases occurred among immigrants, and only 38 of the 556 cases can be considered to be native cases, being found in 14 states and appearing at a rate of about 6 each decade since 1900. The authors report what they consider the first native case from Massachusetts, which occurred in a 44-year-old woman living in a suburb of Boston. She was born in Boston and had never lived in a rural neighborhood, and the nature of her exposure was not determined. The patient was first seen at the Massachusetts General hospital in 1946. At that time she complained of pain in her left thigh dating back 6 years. Roentgenograms showed a mass which had partially destroyed the left wing of the ilium, protruding into the pelvis as a calcified cyst. A chest roentgenogram showed a density in the lower right lung field. The patient was seen again in 1951, when she presented with a large, tender, fluctuant mass overlying the left ilium posteriorly. Anteriorly, a mass was palpable deep in the lower left quadrant of the abdomen. The patient's temperature was 102.4 F (39.1 C), and the white blood cell count was 17,700 per cubic millimeter. Roentgenograms of the pelvis showed a large increase in the size of both the area of bone destruction and the calcified cyst. A chest roentgenogram showed several new round densities in each lung. After a course of penicillin and streptomycin the abscess was opened and was found to communicate with the ilium. A grape-like cyst was found in the pus which flowed out of the incision. On microscopic examination the cyst had a laminated, acellular membrane consistent with that of an echinococcal cyst. The result of the Casoni intradermal test was negative. For several weeks large amounts of pus containing similar cysts drained from the wound. Two additional explorations of the left hip revealed that almost every tissue cut through contained cysts. The entire wing of the left ilium was removed, but the stump of bone left behind was riddled with cysts. In December, 1955, the patient was readmitted to the Massachusetts General hospital for pleuritic pain in the left side of the chest,

cough, and fever. Microscopic examination and culture of the sputum revealed a mixed bacterial flora. After treatment with penicillin, the patient's temperature dropped, and production of sputum ceased. She was discharged 10 days later, and during the next 2 years her clinical state improved. Her hip still drains, but there has been no change evident on roentgenographic examination. Eleven years after discovery of the hydatid infection she is managing her household and has gained so much weight that she is planning to diet.

A review of the 556 cases collected from the literature showed that an echinococcal cyst may be found in any organ of the body but most often in the liver. When the cyst was found in the liver, fewer than 10% of the cases were accompanied by cysts in distant organs. Hydatid infection of organs other than the liver, while less common, was associated with distantly located cysts in 20 to 35% of the cases. Of all the patients, only 10% had cysts in more than one organ. It had recently been shown that the 2 clinical forms of this disease are caused by different species of the parasite. The unilocular cyst is caused by *Echinococcus granulosus*, and the invasive alveolar cyst is produced by *E. multilocularis*. The manifestations of intact, alveolar, infected, partially ruptured, and acutely ruptured cysts are different, and clinical diagnosis is often difficult. The Casoni skin test and the complement-fixation test increase the accuracy of diagnosis but cannot be counted on either to rule in or to rule out the disease. Definite diagnosis requires recovery and identification of the parasitic elements. This is difficult and often impossible. Although there is a newly discovered reservoir of echinococcosis in northwestern Canada and the prevalence of hepatic infection among cattle in the United States is about 0.01%, it does not appear that this disease is becoming a public health problem in the United States.

Experiences with Sulfonyleurea Therapy in Tuberculous Patients with Diabetes Mellitus. S. Marton, T. Bányász and E. Medveczky. *Acta tuberc. scandinav.* (no. 1) 36:36-50, 1958 (In German) [Copenhagen].

Since February, 1956, the authors have used sulfonyleurea preparations in the treatment of 28 patients in whom diabetes mellitus was combined with tuberculosis. The patients were treated with brands of carbutamide. Twenty-six of the 28 patients had active, and usually severe, multicav- ernous tuberculosis. The accepted criteria for the selection of diabetic patients for treatment with orally administered antidiabetic drugs were followed in all but 6 of the patients; in 3 of these the diabetes had become manifest at age 21 or before, and the other 3 were slender, older diabetics. All 6 of these patients required large doses of insulin.

In patients in whom the orally administered antidiabetic sulfonylurea compounds were expected to be adequate for control, the insulin was withdrawn at once and 5 to 6 tablets were given daily in 3 divided doses, whereas in patients having the characteristics of the aforementioned 6 patients (large insulin requirements), the sulfonylurea compounds at first were combined with half of the usual insulin dosage. The concentration of sulfonylurea in the blood of the patient was at first ascertained daily, and later at intervals of 2 weeks; the blood sugar concentration and the liver function were controlled at the same time. The maintenance dose of sulfonylurea was usually 2 tablets.

With such maintenance doses it was possible to achieve complete control of the sugar metabolism in 10 of the patients. In 5 other patients control could be achieved with small additions of insulin. Among the 13 patients who failed to respond to the sulfonylurea therapy, there were 7 in whom according to present-day criteria this treatment would not be tried (extremely unstable sugar metabolism and high-insulin requirements); in these the oral antidiabetic therapy had merely been given on a trial basis. The remaining 6 patients included only 2 in whom all the criteria for successful oral therapy existed. The authors feel that in patients in whom diabetes has begun at an early age oral antidiabetic therapy is not likely to be successful.

In patients with active tuberculosis who are free from fever, the antidiabetic efficacy of sulfonylurea depends on the same factors as in nontuberculous patients. If, however, the tuberculous process is extremely severe, extensive, and accompanied by caseous break-down, then the infectious factor may, in some cases, impair or completely abolish the antidiabetic effect of the sulfonylurea compounds. In tuberculous patients in whom the sugar metabolism is stabilized by the orally administered sulfonylurea, antituberculous drugs are just as effective as they are in those who are effectively treated with insulin. The authors conclude that the use of sulfonylurea preparations is justified and effective in some tuberculous patients with diabetes mellitus.

Carbutamide (BZ 55) in 300 Diabetics: Experiences. A. Cabarron, H. V. Caino, N. O. Bianchi and O. Pintado. *Rev. Asoc. méd. argent.* 72:306-307 (Aug.) 1958 (In Spanish) [Buenos Aires].

Three hundred patients with diabetes were treated with carbutamide (BZ 55) during the past 2 years in the department of nutrition of the San Martín General Hospital in Buenos Aires. The majority of the patients were between the ages of 30 and 60 years. Two hundred twenty-seven patients were obese. Before starting carbutamide therapy, 244 of the patients were under treatment with in-

sulin in doses which varied between 20 and 60 units for periods ranging from 4 to 14 years. Diabetes was moderate in 250 patients, moderately severe in 12, and severe in 11. Seventy-nine patients had degenerative vascular lesions, which were not present in the remaining 221 patients. Carbutamide produced satisfactory hypoglycemic effects in all cases, and these were maintained for some time after withdrawal of the drug or during transgressions of the diet by the patients. The patients were observed by periodic clinical examination, with the taking of hemograms and hepatograms, determination of the renal function, and electrophoresis of the proteins obtained by puncture hepatic biopsies.

The results of treatment in 300 diabetic patients for nearly 2 years led the authors to conclude that carbutamide (BZ 55) is the most efficacious hypoglycemic drug administered orally. It does not produce habituation, degenerative vascular lesions, or other untoward effects. Glycemia is established at a proper level, and the maintenance doses are moderate. The control of hyperglycemia in diabetes is higher with carbutamide treatment than with tolbutamide (D 860) treatment. In the cases observed by the authors, when the clinical nature of the diabetes and the biotype of the patients were favorable, the response to carbutamide therapy was satisfactory in 81% of the patients, was fair in 13%, but failed in 6%. When the nature of the disease and the biotype of the patient suggested only a relatively moderate response to treatment, the results were satisfactory in 58% of the patients, fair in 19%, and poor in 23%.

Acute Gastric Dilatation Due to Nasal Oxygen. J. W. Marrs, R. V. Walker Jr. and W. W. Glas. *Ann. Surg.* 148:835-839 (Nov.) 1958 [Philadelphia].

The authors report on 7 patients with acute gastric or gastrointestinal dilatation, who had been admitted to the Wayne County General Hospital in Eloise, Mich., for various surgical conditions, such as fractures, burns, laceration of the upper extremity, and strangulated hernia. They were in profound shock on admission and were treated by nasal administration of oxygen. Six of the patients died. In these 6 instances the association between the nasal administration of oxygen and acute gastric dilatation was not recognized until the patient was in a dying state or had died. The clinical features of the syndrome observed in the 7 patients showed the following consistent factors: nasal administration of oxygen, rapid abdominal distention, and cyanosis. The blood pressure and pulse varied, depending on the extent of the gastric dilatation and the patient's respiratory function. Roentgenograms of the abdomen invariably revealed marked gastric distention. Nausea, vomiting, and belching were usually present despite

nasogastric suction. Aspiration pneumonitis was a secondary hazard associated with acute gastric dilatation.

In order to substantiate the authors' clinical impression that nasal administration of oxygen could cause acute gastric dilatation and death, experiments were carried out on 6 anesthetized dogs to which oxygen was delivered at 3 liters per minute through a Levin tube which was inserted into the hypopharynx or the esophagus. In all the dogs acute gastric dilatation was produced with marked cyanosis and electrocardiographic changes. Moreover, if a no. 18 needle was passed through the epigastrium into the stomach or the intestine of a dog in which gastric dilatation had been produced experimentally, immediate decompression followed. If irreversible changes due to anoxia did not occur, the spirometric and electrocardiographic recordings returned to normal. None of these dogs developed peritonitis, and all had an uneventful recovery, but experimental evidence indicated that acute gastric dilatation can cause marked impairment of respiration, vagal stimulation, myocardial damage, and even death.

Several factors may be involved in the causation of this syndrome of acute gastric dilatation due to nasal oxygen. If the nasal catheter is inserted too far past the soft palate, 3 or 4 liters of oxygen are delivered to the hypopharynx. In an unconscious or severely injured patient, the base of the tongue may relax to form a valve, and a portion of the gas inevitably finds its way into the esophagus. Swallowing of blood or saliva allows even more oxygen to enter the esophagus, and acute gastric dilatation occurs. Nasogastric suction is beneficial but has not been effective, in the authors' hands, in relieving the acute gastric dilatation. To prevent this complication, all catheters for the nasal administration of oxygen should be inserted by a physician under direct vision. The tip of the tube should lie at the level of the soft palate. But even with the nasal catheter in proper position, if the mouth is completely or partially occluded from trauma or blood, there is potential danger in delivering oxygen to the hypopharynx or the esophagus with resultant gastric dilatation.

The Syndrome of Temporal Arteritis: (Personal Observations and Critical Evaluation of the Syndrome While Reviewing the Literature). R. Spapen. *Acta clin. belg.* 13:384-414 (July-Aug.) 1958 (In French) [Brussels].

The syndrome of temporal arteritis has found steadily increasing attention and has become a recognized clinical entity. This condition, also called Horton's syndrome or giant-cell arteritis, is a diffuse vascular disease affecting particularly persons in the older age groups; its causation, however, remains unknown. The symptoms are unspecific at

the onset of the disease and may be limited for several weeks or months to systemic reactions, such as fever, chills, general malaise, weakness, anorexia, and loss of weight. This stage is followed by local manifestations, including severe headache with tenderness, swelling, and inflammation of the temporal artery on one side or on both sides. Temporal arteritis is often complicated by severe ocular involvement, such as amblyopia and amaurosis, and by other less frequently occurring lesions of the brain, the myocardium, and the mesentery. The course of the disease is characterized by the successive occurrence of exacerbations and remissions for periods ranging from 2 to 6 months. The prognosis for patients with temporal arteritis, so far as life is concerned, is good.

Pathologicoanatomic studies have revealed giant-cell panarteritis involving particularly the cranial arteries. Laboratory findings almost continually indicate in these patients a significant increased erythrocyte sedimentation rate, disturbances in the protein level of the serum with hypoproteinemia, and an increased ratio of α_2 and gamma globulins. The results obtained by the administration of broad-spectrum antibiotics in conjunction with corticotropin (ACTH) or corticosteroids suggest that this medication represents the present-day treatment of choice in patients with temporal arteritis.

An Analysis of 120 Aspiration Needle Biopsies of the Kidney. L. R. Sarin and J. C. Sarin. *J. Indian M. A.* 31:319-320 (Oct. 16) 1958 [Calcutta].

During the last 2 years the authors performed 120 renal biopsies with the patient in the sitting position. As a preliminary to renal biopsy, the clotting time, bleeding time, and prothrombin time were determined in each case to exclude any patient with hemorrhagic diathesis. Local anesthesia was used. The tissue obtained was fixed in a saline solution containing 10% formaldehyde. Paraffin embedding and hematoxylin-and-eosin staining were carried out as a routine measure. The patient was advised to rest in bed for the next 24 hours and was closely observed. Almost all patients in whom renal biopsy was successful had microscopic hematuria lasting for 24 hours and mild backache. Eight patients showed gross hematuria. In one patient the hematuria lasted 8 days, but there were no other harmful effects. The authors observed no bacteremia or perirenal abscess, in spite of the fact that at least 10 of the patients under investigation were found to have chronic pyelonephritis.

Adequate renal tissue was obtained in 103 of the 120 biopsies; in 3 biopsies renal medulla but no cortex was obtained; in 10, fibromuscular tissue; and in 3, liver tissue. In 46 patients with the nephrotic syndrome, renal biopsy alone established the underlying disease. Amyloidosis, chronic lobular nephrosis, pyelonephritis, Ellis type 1 and

Ellis type 2 nephritis accounted for most of these cases. In approximately 20% of the cases clinical and other laboratory procedures pointed to the diagnosis. In a case of pulseless disease, the renal biopsy helped to reveal the underlying pathology of polyarteritis nodosa as a cause of the syndrome. In 36 patients, under 30 years of age, who had diabetes mellitus, renal biopsy revealed morphologic changes that had been considered rare in young persons.

Renal biopsy on 24 patients with pulmonary tuberculosis revealed renal tuberculosis in 3 patients in whom there was neither clinical nor laboratory evidence of the disease; others showed glomerulonephritis, amyloidosis, and pyelonephritis. The other patients on whom renal biopsy was performed had miscellaneous conditions, such as essential hypertension, rheumatoid arthritis, disseminated lupus erythematosus, epidemic dropsy, toxic myocarditis, progressive muscular atrophy, and respiratory infections. It was found that not all cases clinically diagnosed as essential hypertension have the same pathology. The basic lesion in 6 cases was found to be subacute diffuse glomerulonephritis, nephrosclerosis, and pyelonephritis. A patient with rheumatoid arthritis treated with cortisone showed remarkable renal changes. Renal biopsy was more helpful than any other method in establishing the prognosis.

Atrial Fibrillation and Epidural Hematoma Associated with Lightning Stroke: Report of a Case. Z. V. Morgan Jr., R. N. Headley, E. A. Alexander and C. G. Sawyer. *New England J. Med.* 259:956-959 (Nov. 13) 1958 [Boston].

A 52-year-old man was admitted to the hospital in a semiconscious state. He had been found approximately 10 minutes earlier lying unconscious on the floor of a power substation. A lightning storm was in progress at the time. As he was brought into the emergency room, he vomited bright red blood. Physical examination revealed a man in acute distress, responding only to painful stimuli. All deep tendon reflexes were active. The left side of the face was disfigured by burns. There were areas of burns below the left scapula, over the left acromion process, and at the base of the great toe, and there was a 6-cm. laceration over the parietal area on the right. The nose was full of dry, crusted blood. The lung fields were clear on percussion and auscultation. Examination of the heart revealed atrial fibrillation with an apical rate of 80.

An electrocardiogram confirmed the diagnosis of atrial fibrillation, and the patient was given 0.2 Gm. of quinidine gluconate intramuscularly. The scalp laceration was cleansed and sutured. The second-degree burns were debrided of loose skin and were left open to air. After the initial dose of quinidine gluconate, the patient was given 0.2 Gm. intra-

muscularly every 4 hours, receiving doses at 9:10 p. m. and at 1 a. m., 5 a. m., and 12 noon on the next day. After this, he received 0.2 Gm. every 6 hours. The pulse was now regular, and a normal sinus rhythm was confirmed by electrocardiogram. X-ray examination of the skull showed a linear fracture through the right parietal and temporal bones.

The patient remained semiconscious. Quinidine administration was discontinued after 5 days. Two days later the scalp sutures were removed. Healing appeared satisfactory. Examination at this time showed diminished muscle strength in the left upper extremity, and periodic reexaminations during the next 12 hours showed progression of the weakness. In addition, a left-sided homonymous hemianopsia was found. A temporoparietal craniotomy was performed on the right to remove a huge epidural hematoma. It had apparently originated from a tear of the right middle meningeal artery. Bleeding had ceased, but, when the clot was removed, it resumed from this vessel until it was controlled with a silver clip. On the next day the patient was mentally clear for the first time since admission and had a marked gain in muscle strength. Ten weeks after the lightning stroke the burns had healed. The deep tendon reflexes were normal, as was the muscle strength. The patient complained of symptoms characteristic of postural hypotension but was well otherwise.

The fibrillation promptly responded to quinidine, but the literature suggests that this arrhythmia may revert to a sinus rhythm spontaneously. Quinidine appears to be the drug of choice for antifibrillatory treatment. Apparently, the electric shock threw this patient to the floor with sufficient force to fracture his skull and cause an epidural hematoma. A comatose or semicomatose state may ensue from electric shock. Until lateralizing signs develop, it may be impossible to separate coma from electric shock from that due to intracranial hematoma. Surgical treatment of the hematoma apparently produced cure.

SURGERY

Treatment of Persistent Ductus Arteriosus with Reversal of the Shunt by Means of Slow Ligation. I. Boerema. *J. Internat. Coll. Surgeons* 30:553-567 (Nov.) 1958 [Chicago].

In patients with pulmonary hypertension, ligation or suture of the ductus arteriosus causes a high mortality. Ligation of the ductus is extremely dangerous, especially when the direction of flow in the shunt is reversed, i. e., when blood flows from the pulmonary artery into the aorta. Surgical intervention offers far less risk, however, when occlusion of the duct occurs slowly. The author developed a method of slow ligation which makes

it possible to close large vessels as gradually as required. The principle of this slow ligation is based on the swelling of laminaria by absorption of water. By tying a little plastic sac, packed with laminaria and provided with a small opening by which water enters the sac, quite loosely around the vessel which is to be ligated, one immediately produces an insignificant obstruction of the vessel. The increasing swelling of the packed laminaria tightens the thread, so that gradually the total ligation of the vessel is completed. In this way the development of sufficient collaterals is stimulated, and spasm is avoided. By this simple method large vessels were closed completely in dogs. No clinical symptoms due to ischemia of the closed-off organ were observed.

As the simple method of partially tying the vessel with a thread over the laminaria is not practicable in patients with patent ductus arteriosus, the author devised a ring of plastic built around the patent duct. From one side in the ring a plastic cylinder protrudes into the lumen, moving toward the center, so as gradually to close off the lumen of the ring completely. The cylinder is pushed out in order to compress the vessel by means of swelling of the laminaria, which fills a closed chamber behind the cylinder. This chamber has an opening 1 mm. in diameter, which allows the tissue fluid to enter the chamber. Consequently the laminaria swells, but very slowly, as the opening is small. In the plastic ring and in the cylinder, metal marks are built in, so that roentgen-ray examination of the patient gives an exact picture of the drive out of the cylinder. Thus, one can follow exactly when the lumen of the ring is closed, which means that the duct has gradually closed completely.

This technique was employed in a 9-year-old girl who had 5 attacks of severe pneumonia due to an atypical patent ductus arteriosus. At thoracotomy a ductus was found with a diameter of 8 mm. The left pulmonary artery had about the same diameter as the aorta of an adult. The pressure in the pulmonary artery was 70 mm. Hg systolic and 60 mm. Hg diastolic and in the aortic arch, 90 mm. Hg systolic and 70 mm. Hg diastolic; in the descending portion of the aorta there was a mean pressure of 45. Thirteen minutes after clamping on the ductus arteriosus, the pressure in the pulmonary artery was 75 mm. Hg systolic and 50 mm. Hg diastolic; in the aortic arch, 170 mm. Hg systolic and 120 mm. Hg diastolic; and in the descending portion of the aorta, 45. It was quite clear that sudden closure of the duct would cause the death of the child. The patient, therefore, was given a trial slow ligation. Three months after that a rethoracotomy was performed, which showed the ductus to be completely closed. It was doubly ligated and transected. The pulmonary artery was still enormously dilated. The descending portion of the aorta had a diameter not larger than that of a pencil. Slow

ligation did not cause any critical moment during closure of the duct. The pulmonary pressure fell gradually during 7 weeks to the very low level of 12 mm. Hg systolic and 7 mm. Hg diastolic. The recovery of the child was uneventful. She is now much livelier than before the operation and has no complaints whatsoever. Thus, the method of slow ligation of the patent ductus arteriosus was successful in a dangerous case. In patients with severe pulmonary hypertension with reversal of the shunt, this method seems decidedly worth giving a trial.

Late Results of Operations for Fallot's Tetralogy. M. Campbell. *Brit. M. J.* 2:1175-1184 (Nov. 15) 1958 [London].

Three methods of surgical treatment are now available for the tetralogy of Fallot: (1) subclavian-pulmonary anastomosis or some modification of it; (2) Brock's direct operations of pulmonary valvotomy or infundibular resection or both; and, more recently, (3) open operation with closure of the ventricular septal defect and relief of the stenosis. This paper reviews, first, the results of the anastomotic methods. In a report made in 1953, the author had included 200 patients with all types of morbus caeruleus (cyanotic group of congenital heart disease, with persisting venous-arterial shunt). In this paper he considers only those whose disorder was diagnosed as Fallot's tetralogy; although this group includes some in whom autopsy revealed more complex lesions, it excludes those with pulmonary atresia or tricuspid atresia. There remained 130 patients in whom the results of anastomotic operations were excellent or good, and 126 of these were either seen recently by the author or followed up otherwise. Eight of the patients (6%) have died, and 17 (14%) have lost much or all of their improvement, but 101 (80%) are in as good, or nearly as good, condition as they were. These have been followed for an average period of 7½ years. Ten of the 17 patients in whom there was loss of improvement have already had direct operations; 6 obtained good results, but the other 4 died.

Commenting on direct operations for Fallot's tetralogy, the author says that the results of pulmonary valvotomy and infundibular resection in the first 100 patients operated on by Brock were reported by him and others in 1954. The operative mortality was 15%; there was little or no improvement in 14%, but there were good results in 71%—figures not very different from those after anastomotic operations, except that the operative mortality was higher. Now a longer follow-up is reported on 61 of these patients, and another 50 who were operated on between 1953 and 1956 are added to the series. The operations performed on these 111 patients were mainly infundibular resection in 47, pulmonary valvotomy in 42, or both

procedures in 22. Nineteen of the 111 patients died at or soon after operation, 13 obtained little or no improvement, and 79 (71%) obtained good results. None of these 79 has been lost sight of, and they have been followed for an average period of nearly 5 years—32 for from 6 to 9 years. Of the 79 who obtained good results, 70 (89%) have remained well during the subsequent years.

The long-term advantage of the direct operations is greater than the figures indicate, for there were only half as many deaths and half as many patients who lost all their improvement with direct as with anastomotic operations. It is thought that perhaps half of those who obtained good results may be reasonably well 20 years after operation. After anastomotic operations, increasing difficulty in hearing the continuous murmur is a bad sign, and, if it cannot be heard, the anastomosis has probably closed. The auscultatory signs after direct operations are not so much help. The reduction in anoxemia and resultant polycythemia and in the high hemoglobin level that was found 3 or 4 years after the operation has been maintained in most patients for the 6 to 10 years of this longer follow-up, but not in those who had lost their clinical improvement.

The heart increases in size within a few weeks after a successful anastomotic or direct operation. The ideal is a limited increase, large enough for a reasonable pulmonary flow that will enable the patient to do more but not large enough to throw an undue strain on the heart. This increase is generally about 10%; it is unlikely to be progressive, and there is no reason to be anxious about it. In fact, if a heart that has become larger returns to near its original size, especially if the hemoglobin returns to its original level, the anastomosis has probably closed or the increased pulmonary flow has been lost by the stenosis becoming more severe. Neither of these operations for Fallot's tetralogy is curative, for the ventricular septal defect remains. Generally, however, they produce great improvement that lasts for many years. When the ventricular septal defect can be closed, it should not be difficult to relieve the infundibular or valvular stenosis.

Ewing's Sarcoma: Ten-Year Survivals: Report of a Case with Recurrent Pulmonary Metastases. H. N. Harrison. *Ann. Surg.* 148:783-789 (Nov.) 1958 [Philadelphia].

The author reports on a 23-year-old man with Ewing's sarcoma involving the tibia of the right lower extremity which was amputated. The patient survived 10 years despite the occurrence of 2 episodes of pulmonary metastasis. The first occurred 3 years after the amputation of the lower extremity and was treated successfully by surgical removal of the metastatic lesions from the lingula and the

left lower lobe. The second metastasis occurred 4½ years later and was treated by intensive irradiation of the left hilar region. At the time of the writing of this report the patient was clinically and roentgenographically free of disease, 2½ years after the last episode. The case of this patient is believed to be the first reported of Ewing's sarcoma with metastases to the lung which were removed surgically. This is also the first case of a patient with recurrent pulmonary metastases who has survived 10 years.

Nineteen additional cases of histologically proved Ewing's sarcoma in patients who survived 10 years or more were collected from the English literature. There were no special features which characterized this group prognostically. In an attempt to arrive at a significant 10-year survival rate, only those reports in the literature dealing with more than 50 cases of Ewing's sarcoma were chosen; of a total of 370 patients, 15 survived 10 years or more, representing a 10-year survival rate of only 4%. This fact, however, emphasizes that the prognosis of Ewing's sarcoma is not uniformly hopeless. No report of death resulting from Ewing's sarcoma after 10 years was found in the literature, and most patients who died of recurrent disease died within 3 years. If patients survive this period, there is good statistical evidence that they will survive 10 years.

The cases of 6 patients with Ewing's sarcoma complicated by pulmonary metastases which regressed completely were collected from the literature. The metastatic lesions disappeared spontaneously in 3 of the 6 patients, and as a result of irradiation therapy in the other 3. Four of these 6 patients survived 10 years or more, while another is alive and well 7 years after initial therapy.

Diagnostic Significance of the Determination of Gases in the Blood of Patients with Atrial Septal Defect Alone or Associated with Other Cardiovascular Abnormalities (Study of 257 Cardiac Catheterizations). A. Bonelli and H. Hilke. *Chir. torac.* 11:262-280 (June) 1958 (In Italian) [Rome].

The difference between the oxygen content of blood in the right atrium and that in the venae cavae was determined by intracardiac catheterization in 257 patients with atrial septal defect alone or associated with other cardiovascular abnormalities. Blood oxygen concentrations, measured by the manometric method of Van Slyke, were investigated in 203 patients for diagnostic purposes and in 54 patients for the purpose of postoperative follow-up. The average for the normal oxygen content of blood in the venae cavae was taken as 14.7 vol.%. The authors are in accord with Bing and co-workers in considering the incremental rate within 1.5 vol.% as the normal rate of increase in the oxygen content of blood in the right atrium as

compared with that in the venae cavae, that is, an increase of approximately 10 vol.% in the oxygen content of blood in the right atrium as compared with that in the venae cavae. Values of more than 1.5%, indicative of a diagnosis of atrial septal defect alone, were found in 154 patients (76%).

The rate of increase in the oxygen content of blood in the right atrium as compared with that in the venae cavae varied within the normal limits in 5 patients who had atrial septal defect associated with stenosis of the tricuspid valve. Cardiac catheterization was, therefore, diagnostically useless in these 5 patients. Cardiac catheterization had a diagnostic value in 2 patients who had atrial septal defect associated with stenosis of the mitral valve and in 2 patients who had atrial septal defect associated with ductus arteriosus, because the incremental rate exceeded the normal limit. Cardiac catheterization was useless for the purpose of differential diagnosis between the atrial septal defect alone or one associated with transposition of the pulmonary veins in 33 patients who had transposition of 1 pulmonary vein and in 6 patients who had transposition of 2 pulmonary veins. This method had diagnostic value in 4 patients with transposition of the pulmonary veins connected with the superior vena cava but without atrial septal defect.

A large atrial septal defect exceeding 5 cm. was found in 17 patients at operation. An increase to more than 20 vol.% in the oxygen content of blood in the right atrium as compared with that in the venae cavae was observed in 12 of the 17 patients (64%). Cardiac catheterization revealed that the rate of increase in the oxygen content of blood in the right atrium as compared with that in the venae cavae was within normal limits in about 40 of 54 patients who were operated on.

Refinements in Prevention of Recurrent Carcinoma Prior to and During Resection of the Colon and Rectum: Preliminary Report. M. E. Bacon and J. L. Berkley. *J. Internat. Coll. Surgeons* 30:539-546 (Nov.) 1958 [Chicago].

The authors report on 1,760 private patients with carcinoma of the large intestine, 92% of whom were subjected to the routine procedure for excision of the descending colon, sigmoid, and rectum. Of these patients, 440 were operated on between 1949 and the end of August, 1958, by adding the technique of aortoiliopelvic lymphadenectomy to the routine procedure. The mortality rate was 3%, and the results of extended node dissection proved gratifying in that the 5-year survival rate of patients operated on for carcinoma of the rectum was increased from 53 to 59% and that of patients with carcinoma of the descending colon from 67 to 71%. The problem of recurrence by implantation of free carcinoma cells still prevents achievement of a

survival rate proportionate to the surgeon's efforts. The question of the enema as a means of intraluminal spread is seriously considered.

Since March, 1958, Clorpactin XCB, a form of monoxychlorosene, was employed by the authors routinely in all radical resections for cure; 5 Gm. of this cancericidal agent in 1,000 cc. of sodium chloride solution (a 0.5% strength) was used for an enema 2 hours before the start of the operation, and intraoperatively the portion of the intestine containing the tumor was immediately covered with a thick pad saturated with Clorpactin XCB solution. Fifty cubic centimeters of the solution was injected into the lumen of the intestine between the ligatures, below the lower ligature and above the higher ligature, and remained in these areas until anastomosis was begun. Repeated irrigation of the peritoneal cavity with as much as 1,000 cc. of the solution had no harmful effects on the normal tissue and did not interfere with normal tissue growth or satisfactory wound healing. Sufficient time has not yet elapsed for a statistical report, but smears taken for cell study and chemical tissue reaction are being evaluated in cooperation with ancillary departments. More time and similar studies by other interested workers will be required to justify definite conclusions.

Implantation Metastases from Cancer of the Large Bowel. P. Boreham. *Brit. J. Surg.* 46:103-108 (Sept.) 1958 [Bristol].

Boreham cites the history of a man who underwent a right-sided hemicolectomy for a growth partially obstructing the ileum. The terminal ileum and ascending colon were removed, and an end-to-end anastomosis of terminal ileum to transverse colon was made. The patient's recovery was uneventful. On the first anniversary of his operation he was readmitted with a hard lump in the muscles of the abdominal wall beneath the lower end of the paramedian scar. It proved to be a metastatic deposit in the scar. The lump decreased in size after high-voltage irradiation, but the patient died of numerous metastases 5 months later. It seems possible that the metastatic deposit arose from a fragment of carcinoma implanted into the wound at the time of operation. The studies described are concerned with the frequency with which such implantation metastases occur, with the manner of implantation, and with means for their prevention. If metastases occur in operative scars by implantation of cells from the peritoneal surface of an intestinal cancer, one would expect them to be seen around colostomies after perineoabdominal excision of the rectum, because it is usual to lead the specimen, with its lower end tied into a glove, out through a small wound in the left iliac fossa, before dividing the intestine above the growth to make the terminal colostomy. During this maneuver the

outer surface of the excised part containing the growth is wiped over the edges of the colostomy wound.

The author describes 2 cases which illustrate metastases possibly arising by implantation in this way. He has records of 5 other cases of recurrences around a colostomy, but in 2 of them the growth was very extensive locally; 2 others followed a Paul-Mikulicz type of resection where the possibility of contamination of the wound by intestinal contents cannot be excluded; and 1 other patient had 4 carcinomas of the rectum associated with familial polyposis coli, so that the tumor developing at the colostomy was very likely another primary carcinoma. The author also collected a number of cases of recurrences in the perineum after excision of the rectum for carcinoma, but he could not find a case where the recurrence could not have arisen owing to incomplete excision of local spread. He thinks that some perineal recurrences occur by implantation of cancer cells from the lumen of the intestine into the wound when spill is allowed to occur. Searching clinical and outpatient records for further implantation metastases in abdominal scars, he found only 7 other cases with tumors in scar tissue, and 2 of these proved to be nonmalignant. In only 3, and possibly 5, of 10 patients did contamination of the wound by the peritoneal surface of the growth seem to have given rise to implantation metastases.

Further evidence of this mode of spread was sought for in 3 ways: 1. Smears were taken onto a slide by rubbing the edge of it over the peritoneal surface of the specimen opposite the growth and especially where the peritoneum was puckered. These smears were stained mostly by Papanicolaou's method and were compared with smears similarly obtained from the peritoneal surface of the normal intestine and with smears made of mucus from within the intestine and with paraffin sections of the primary tumor. Fifty-two specimens were examined in this way, and the author was unable to detect any malignant cells in the smears taken from the serous coat of the intestine. 2. Sections were cut across the thickness of the intestinal wall through any point of peritoneal puckering or apparent ulceration opposite the growth. In 35 carcinomas of the large intestine arising above the peritoneal floor, 16 were found to show puckering, and in only 4 of them were malignant cells found ulcerating onto the peritoneal surface of the intestine. Granulation tissue and fibrin seem to proliferate on the peritoneal surface of the growth and prevent cancer cells from being shed into the peritoneal cavity or onto the wound or the surgeon's hands. This protective layer of fibrin and granulation tissue may be only a few cells thick. Therefore, the growth should be handled as little as possible, or it should be covered with a swab. By incorporating a thin sheet of malleable metal

in the swab, it can be molded onto the growth by finger pressure, and thus damage caused by the tying of tapes can be avoided. 3. The author intended to use this technique and to compare the results with earlier series. He found so few recurrences in scars, except where the growth was advanced or gross contamination of the wound with intestinal contents occurred, that this was abandoned.

The author feels that he demonstrated conclusively that carcinoma of the large intestine does give rise to implantation metastases. These occur on the raw surfaces in the intestine below a growth, especially fistulas and wounds at the anus. They also occur on suture lines in the large intestine after resection of a growth unless precautions are taken to prevent this. Only one recurrence at the suture line by implantation has occurred since the instigation of routine irrigation of the intestine with perchloride of mercury below an occluding clamp before division. In this one case the clamp slipped, and there was gross contamination of the wound by intestinal contents.

NEUROLOGY & PSYCHIATRY

Electroencephalographic Changes During the State of Coma. C. Loeb. *Electroencephalog. & Clin. Neurophysiol.* 10:589-606 (Nov.) 1958 [Montreal].

The author studied 25 selected patients affected with coma, from the clinical, electroencephalographic, and anatomic standpoints. With the use of signs and symptoms commonly found in comatose patients as parameters, the different degrees of coma were subdivided for practical purposes as follows: Of the 25 patients, 2 had impairment of consciousness, 14 had moderate coma, and 9 had deep coma. Concerning the type of electroencephalographic activity observed in these patients, 15 had generalized electroencephalographic changes characterized by continuous or intermittent activity, 7 had unilateral electroencephalographic changes characterized by continuous or intermittent activity, and 3 had focal electroencephalographic changes represented by isolated waves or short bursts, localized in a restricted area over one hemisphere. Postmortem examination of the brain was performed on 17 patients, and the site of the cerebral lesion was reconstructed on the basis of macroscopic and microscopic sections. Of the 25 patients, the meninges were the site of the cerebral lesion in 3; one cerebral hemisphere, in 15 (with impairment of cortex and white matter in 6, impairment of white matter and basal ganglions in 7, and impairment of cortex, white matter, and basal ganglions in 2); multiple lesions in both hemispheres, in 1; multiple lesions, involving white matter, basal ganglions, and brain stem, in 3; and diffuse lesions, including edema and vasoparalysis, in 3.

The electroclinical results show that a generalized, slow, organized activity is not necessarily the bioelectric expression of most of the patients afflicted with coma. No definitive relationships are found between degree of coma and type of electroencephalographic changes. Moreover, the possibility of eliciting a bioelectric response to stimuli does not appear to be related to the depth of coma. Many different anatomic, circulatory, functional, and metabolic changes may account for the type and distribution of the electroencephalographic activity during some states of coma in man. The possibility of finding some schematic and stable relationships between the state of consciousness and the electroencephalographic activity, as many other workers do, seems to be very difficult. It seems possible to affirm, in general terms, that with the exception of a few isolated cases, in which the downward progress of coma was accompanied by a corresponding aggravation of the electroencephalographic changes, the great majority of the patients showed electroencephalographic alterations similar to those recorded in patients with comparable anatomic lesions but without modification of the state of consciousness.

Conservative vs. Surgical Treatment of Cerebral Aneurysms. F. Benson. *Neurology* 8:852-856 (Nov.) 1958 [Minneapolis].

Observations on 40 patients with angiographically proved intracranial aneurysms, who were treated at the San Francisco Veterans Administration Hospital from 1946 to 1956, are reviewed. The data shed some light on the long-term prognosis of conservatively treated intracranial aneurysms. Of these 40 patients, 17 are known to be dead, 14 are still living, and 9 have disappeared from the study group; 22 were treated surgically, and the remaining 18 patients either were treated conservatively or died before surgery could be performed. There were 8 deaths among those who were operated on and 9 deaths among those who did not undergo surgery, with 13 of the 17 deaths occurring in the critical period after onset of symptoms. Of the 4 deaths occurring a year or more after the original disease, 2 involved surgically treated and 2 conservatively treated patients. From the survival times of the 14 patients who are still alive, it again can be seen that the surgically and the nonsurgically treated groups are about equal, each having 6 cases with survival times of 1 to 11 years.

The statistics usually referred to in predicting the outcome of conservatively treated intracranial aneurysms are those of subarachnoid hemorrhage. This is a symptom complex, not a specific disease entity, and the prognosis varies with the etiological factor. If one excludes trauma, probably more than one-half of the cases of subarachnoid hemorrhage are due to rupture of an intracranial aneurysm.

Even so, it is hardly accurate to consider the long-term prognosis of these two as equivalent. Many of the other causes of subarachnoid hemorrhage are chronic degenerative processes with an ultimately fatal outcome; for instance, bleeding into a tumor, blood dyscrasias, intracerebral hemorrhage, and heavy metal toxicity are all causes of subarachnoid bleeding with a generally poor prognosis. The statistics used at present to predict the outcome of conservatively treated intracranial aneurysms are weighted with prognostically unfavorable cases which are not aneurysms.

Most neurosurgical attacks on aneurysms are delayed 2 weeks or more after the initial hemorrhage, so this very sizable number of fatalities present in conservatively treated series does not appear in the surgically treated group. Thus, it becomes apparent that patients who survive long enough to undergo surgery have a far better prognosis than the group as a whole and brings into doubt the statistics providing that all bleeding aneurysms deserve surgical therapy. The author stresses that, when those patients who die in the early danger period are excluded, conservatively treated and surgically treated aneurysms have nearly the same prognosis. Some cases of bleeding intracranial aneurysms are best treated conservatively.

Pituicytoma, a Tumor of the Hypothalamus: Clinicopathological Report of a Case. L. Liss. *A. M. A. Arch. Neurol. & Psychiat.* 80:567-576 (Nov.) 1958 [Chicago].

The author reports the history of a woman who at the age of 19 became amenorrheic and obese. Later, symptoms of diabetes insipidus, masculinization, hypothyroidism, mental changes, and, finally, epilepsy developed. The patient lapsed into coma, hypostatic pneumonia developed, and she died. The total duration of the disease was 11 years. Autopsy revealed that the tuber cinereum was enlarged; the upper part of the infundibulum and the floor of the third ventricle were thickened, dark gray in color, and hard in consistency. The posterior lobe of the hypophysis was atrophic and barely visible. Histological studies were made on the portions of the brain that appeared abnormal on gross examination.

There was evidence that the symptoms exhibited by this woman were caused by a neoplasm of the hypothalamus, which was well differentiated and histologically resembled neurohypophyseal tissue. In the tumor were found 3 types of pituicytes: the bipolar with homogeneous protoplasm (type 1A), the astrocyte-like (type 2), and the glomerular (type 4). Not present in the tumor were the bipolar pituicytes with granular protoplasm (type 1B) and the triangular variety (type 3). These histological characteristics suggested that the tumor originated in the upper part of the infundibulum and infil-

trated the hypothalamus. The normal satellite structures in the hypothalamus were replaced by the neoplasm. The neurosecretory neurons were not destroyed by the neoplasm and were apparently functioning. The "neurosecretory granules" were found in numerous nerve fibers of the hypothalamohypophyseal tract and were deposited in numerous Herring bodies in the hypothalamus and upper infundibulum. The perivascular structures formed by the pituicytes in the neoplasm are similar to those of the normal neurohypophysis. The posterior lobe of the pituitary is atrophic, a condition which may be caused by the functional replacement by the neoplasm.

The pituitaryoma described here is a slow-growing and well-differentiated glioma which is formed by 3 types of the highly specialized glial elements of the neurohypophysis. The histological analysis proves that pituicytes are highly modified glial elements which even in a neoplasm may preserve their characteristic appearance. However, it should be stressed that positive identification of the tumor cell, as well as various cellular forms in the normal neurohypophysis, was made possible only by employing variants of the Hortega silver carbonate technique.

PEDIATRICS

Regarding the Stevens-Johnson Syndrome. C. Juntke. Arch. Kinderh. (no. 2) 158:129-134, 1958 (In German) [Stuttgart, Germany].

Although the Stevens-Johnson syndrome (ectodermosis erosiva pluriorificialis) as regards location of efflorescence, the involvement of the mucosa, formation of crusts and scales, and tendency to recurrence differs somewhat from erythema exudativum multiforme, it is now generally regarded as the most severe form of this entity. The cause of these disorders is still unknown, and the nomenclature is not uniform. Baader in 1925 suggested the term "dermatostomatitis," and Wechselberg in 1954 recommended "polymorphic ectodermosis." This last term would include cutaneous manifestations in the form of erythema exudativum multiforme, the mucosal lesions in the form of pluriorificial ectodermosis, and the combination of both in the severe form of the Stevens-Johnson syndrome. The disease usually runs its course in from 3 to 5 weeks.

The author reports a 10-year-old girl in whom the severe form of the Stevens-Johnson syndrome began in an atypical manner, so that the diagnosis proved difficult. The girl appeared confused, very ill, with severe motor unrest and crying. Her face was bloated, and the eyelids, lips, and gingivae were severely swollen. The tips of the fingers were suffused with blood and swollen. There was a yellowish coating at the base of the tongue, and the whole body, but especially the trunk showed an exanthem of small, dark red spots that did not

resemble erythema exudativum multiforme. At first the disorder was regarded as a sepsis with a fulminating purpura. Despite treatment with penicillin, Terramycin, blood transfusion, and infusion of calcium, new hematomas developed on the toes; then swellings and hematomas decreased, and the exanthem became paler. Several days later hemorrhages recurred on the hands and feet, the oral mucosa was inflamed, pains persisted, and there was no improvement. After that the picture changed to that of the severe Stevens-Johnson syndrome. Because antibiotic therapy had been largely ineffective, cortisone was now given, and rapid improvement followed. Cortisone produced the same favorable therapeutic effect in a 13-year-old boy who had pluriorificial ectodermosis with a tendency to recurrences.

Experiences with Prolonged Cortisone Therapy in Children with Nephrosis. H. Hanssler. Arch. Kinderh. (no. 2) 158:110-121, 1958 (In German) [Stuttgart, Germany].

The author reports on 9 children with nephrosis who were treated with adrenocortical hormones. The children ranged in age from 2 to 7½ years. All had an accelerated erythrocyte sedimentation rate, reduction in the level of serum albumins, increase in the alpha₂ and beta globulins in the presence of increased cholesterol values, severe proteinuria, occasionally slight urinary excretion of erythrocytes, and normal blood pressure values. Edema existed in all patients. Only cortisone or prednisone was used for hormone therapy, never corticotropin. Antibiotics were always given in addition to the adrenocortical hormones. Some of the children had received thyroid hormone before onset of the cortisone therapy, and some received both hormones together. The diet was high in proteins and carbohydrates but low in sodium chloride, and the intake of fluid was restricted. The body weight, the intake of food and fluid, and the urinary excretion were controlled daily. Factors checked at longer but regular intervals included the total plasma protein content, levels of serum proteins and serum cholesterol, erythrocyte sedimentation rate, protein content of the urine, urinary sediment, and blood pressure.

These children were observed for from 5 months to 4½ years. It was found that short-term hormone therapy was ineffective, but with the prolonged use of hormones all except 2 of the children achieved remissions. Seven of the 9 patients were free from symptoms at the termination of the hormone therapy. The size of the dose and the duration of treatment with adrenocortical hormones were decisive. Prednisone was given in dosage of 3 mg. per kilogram of body weight daily for at least 2 or 3 weeks. The dose was next reduced to 2 mg. per kilogram of body weight for about 3 weeks, and

then to 1 mg. per kilogram of body weight. The maintenance dose, after 8 or 9 weeks of treatment, was 10 to 15 mg. of prednisone per day.

Generally edema and proteinuria disappear first, and this is followed by normalization of the erythrocyte sedimentation rate, whereas dysproteinuria and high serum cholesterol values may be present several weeks longer. Normalization of these values does not insure cure of nephrosis, and it appears advisable to continue maintenance therapy for several months after normalization of the cholesterol and protein values. Secondary effects in the form of moon-face, generalized obesity, and secondary increase in blood pressure must be accepted, the more so since these effects usually subside after discontinuation of the hormone therapy. Simultaneous antibiotic therapy is recommended. The favorable effects of hormone therapy are restricted to nephrosis without nephritic components.

An Epidemic of Abacterial Meningitis. K. Nissler and A. Regitz. *Arch. Kinderh.* (no. 2) 158:121-128 1958 (In German) [Stuttgart, Germany].

During the summer and fall of 1956 an epidemic of meningitis of obscure etiology occurred in many cities and towns of central Europe. The incidence was especially high in Magdeburg, where 254 children and 251 adults were hospitalized with this form of meningitis in the course of 6 months. The largest number of an estimated 5,000 patients received ambulatory or no treatment. Among the children the male-female ratio was 1.4:1. Headache was the most constant symptom, whereas nuchal rigidity occurred in only 36% of the patients, and vomiting in 74%. Increase in temperature was sometimes absent, but it frequently rose to above 39 C (102.2 F). Defervescence usually occurred by the 6th day. Nineteen per cent of the children had morbilliform and petechial exanthems. The cerebrospinal fluid generally showed only a slight increase in protein content, but its cell count was frequently high (over 10,000 per cubic millimeter). Neither encephalitic symptoms nor other after-effects were observed. The headaches usually disappeared after the lumbar puncture. Except for bed rest, no treatment was given or was necessary. Studies by Professor Pette at the Research Institute for Infantile Paralysis indicated that this disorder was an infection with Coxsackie virus, group A.

OTOLARYNGOLOGY

Primary Rhinopharyngeal Tumors in Children. A. Correa and L. Paiva. *Rev. hosp. clin.* 13:363-370 (Sept.-Oct.) 1958 (In Portuguese) [São Paulo].

Twelve children, ranging in age from birth to 12 years, with rhinopharyngeal tumors were observed during a period of 10 years at the Otorhinolaryn-

gologic Clinic of São Paulo University. The type of tumor in 5 cases was an angiofibroma; in each of the other 7 cases it was a chondroma, a carcinoma, a lymphoepithelioma, an endothelioma, a myxosarcoma, a myosarcoma, and a fibrosarcoma. Diagnosis of the type of tumor was made by biopsy and by clinical, neuro-otorhinolaryngologic, and roentgen-ray examinations. It was observed that angiofibroma and chondroma are tumors of slow development, which produce chronic nasopharyngeal obstruction and frequent nasal hemorrhages. They are elastic on touch, do not metastasize, and produce deformation of the patient's face as they progress into the maxilla and the orbit. Roentgenographically, the benign tumors appear encapsulated, expansive, and nondestructive. They are amenable to surgical removal, with recovery of the patient. Malignant rhinopharyngeal tumors terminate after a very rapid development in the patient's death. They rapidly involve the structures and nerves at the base of the cranium, the orbit, the palate, and the cervical lymph nodes. The commonest early symptoms are headaches, visual, auricular, and nasosinusal disorders, and trigeminal neuralgia. Roentgenotherapy and chemotherapy may or may not produce slight transient improvement in the patient's condition.

The life span of patients with carcinoma is shorter than that of patients with sarcoma. The span is likewise shorter in patients with tumors involving the nerves at the base of the cranium than in those in whom the tumor grows into the nasal fossa and the oropharynx. The younger the patient, the more rapid and the more severe the course of the disease. In the cases reported by the authors, the 6 patients with benign tumors recovered after surgical removal of the tumor, after roentgenotherapy, and after testosterone therapy. The 6 patients with malignant tumors died within 1 to 6 months after the appearance of nervous symptoms. Autopsy showed multiple metastases and the invasive and destructive character of the tumors as they involved the structures and nerves at the base of the cranium.

Toxoplasmosis and Congenital Deafness. G. Kelemen. A. M. A. *Arch. Otolaryng.* 68:547-561 (Nov.) 1958 [Chicago].

The author comments on the global distribution of toxoplasmosis and on the fact that, on the basis of reactions to Toxoplasma antigen, it exists in from 30 to 60% of some urban populations. The causative agent, Toxoplasma gondii, is a protozoan parasite, of crescentic shape, 7 μ in length and 2 to 4 μ in width. Every warm-blooded animal can be infected with it. It is transmitted in the form of a low-grade infection to the offspring; it may be acquired during adult life and need not be fatal. From human lesions animals can be reinfected. Higher incidences of

toxoplasmosis than in normal populations have been reported in patients with mental disease, particularly in those with Mongolism (as high as 75%). The discovery of advanced toxoplasmosis in the newborn infant suggests that the mother acquired the disease during or before pregnancy. The embryopathy caused by toxoplasmosis may result in stillbirth or prematurity, although the mother generally presents no symptoms of the disease. Transplacental infections occur through maternal leukocytes, with or without lesions to the placenta itself. Congenitally infected children most often show lesions limited to the central nervous system. Eye lesions are characteristic. Reports on involvement of the ears are rare.

The author reports 2 infants, one of whom was hospitalized 2 weeks after birth and died 10 days later, and the other was a stillborn boy. The autopsy reports and the histological studies on the ears of these infants are described in detail. In the first child the parasite was demonstrated, and in the second toxoplasmosis was indicated by general pathological signs. While in the ear the skeletal elements and the sensory end-organs were found to be in an adequate developmental stage, conspicuous changes were found in the soft tissues, mesenchyme, and mucoperiosteum. In the first case, with calcium deposits in the brain, similar formations showed up in the spiral ligament, predominantly in the vascular stria. Analysis of the changes pointed to an irritative state, running the whole scale from engorgement to organizational products. Every sign reached its acme in the niche of the oval window.

Infantile toxoplasmosis is known to make a first-line attack on the central nervous system, and the author feels that it is one of the hitherto undisclosed sources of congenital hearing defects. Toxoplasmosis being present in an overwhelming segment of the population of all climates, the elucidation of its role in congenital deafness requires a large-scale investigation at the pathological and the clinical level.

Stapes Mobilization: Analysis of Results in 250 Operations. E. H. Campbell. A. M. A. Arch. Otolaryng. 68:663-672 (Dec.) 1958 [Chicago].

Advances in the operative technique of stapes mobilization have proceeded through logical steps from Rosen's original method which attempted mobilization at the stapes neck, through the method of pressure on the incus, various maneuvers at the stapes head, and finally to various kinds of manipulations of the stapes footplate. Numerous operators reached the conclusion that more successful mobilization can be accomplished by manipulations of the footplate and taking care to avoid dislocation of the incudostapedial joint and fractures of the crura. There is now general agreement that

manipulations of the footplate with avoidance of crural fractures and dislocation of the incudostapedial joint give the best chances for successful results. The author presents an analysis of results obtained in 250 stapes mobilization operations.

The technique employed, in the great majority of the cases, was a pulsating pressure applied alternately to various parts of the stapes footplate, and the incus, and to the head of the stapes. The results were judged largely on the basis of improvement of hearing to the 30-db. level or better and the improvement to or near the level predicted on the basis of the preoperative bone conduction. In 11 patients, or 4.4% of the 250 cases, the improvement of hearing has reached to practically the normal line (an average of less than 7-db. loss to the speech frequencies). In 120 additional patients, or 48% of the 250 cases, the hearing was improved to the 30-db. level or better. A serviceable hearing level was thus obtained in 52.4% of the cases. Mobilization was as successful in patients over 55 years of age as in those between 20 and 30. Fifteen patients, or 6%, obtained an improvement of 15 db. or more, and in 7 of these the hearing was improved to the preoperative prediction level.

In 21 patients, or 8.4% of the 250 cases, the hearing was made worse by the operation. Most of these were worse by less than 10 db. The loss of hearing after operation appeared to be caused chiefly by fractures of the crura and dislocation of the incudostapedial joint in nearly all the cases. Mobilization was unsuccessful for the following reasons: (a) incomplete or partial loosening of the footplate; (b) fractures of one or both crura; (c) dislocation of the incudostapedial joint; (d) advanced diffuse otosclerotic stapes fixation; (e) anomalies of the conduction mechanism; and (f) adhesive formations in the middle ear.

A revision of the mobilization was carried out in 12 patients in whom the mobilization was apparently incomplete; 4 of these revisions were entirely successful, and 3 additional ones were partially successful. The fenestration operation was performed on 43 of the 112 patients who had been mobilization failures. Thirty-four (or nearly 80%) of these operations have been entirely successful, and 5 have been partially successful. Complications have been of a minor nature, consisting of prolonged dizziness or sense of unbalance, occasional perforations of the tympanic membrane, and in 2 cases secondary middle-ear infections.

The Surgical Treatment of Chronic Suppurative Otitis Media. H. L. Williams. A. M. A. Arch. Otolaryng. 68:574-586 (Nov.) 1958 [Chicago].

Williams of the Mayo Clinic criticizes the suggestion made by Ballance that radical mastoidectomy with skin grafting should be done in any case

of chronic suppurative otitis media. He based this opinion on an analogy to chronic osteomyelitis of other bones. The author shows that the analogy to chronic osteomyelitis of long bones is inexact, and holds good only in the rare instances of chronic disease of the petrous apex. Ballance did not distinguish cases of perforations and simple mucoid discharge from cases of bone disease and cases in which cholesteatoma was the basis of the suppuration. Wittmaack by his theory of pneumatization provided further grounds for the tendency to operate on all types of chronically draining ears, since he suggested that the small-celled and eburnated mastoids with their pathological mucosa were doomed to continued suppuration. As a result, radical mastoidectomy was advised in cases in which the procedure added but little to the well-being of the patient. In an attempt to solve this problem, Lillie presented a classification of chronic suppurative otitis media in 1928, which, although modified from time to time, is still in use at the Mayo Clinic.

The present version of the classification into 3 types is presented, and it is pointed out that chronic suppurative otitis media of types 1 and 2 does not justify mastoidectomy. In the third type the perforation of the tympanic membrane is usually marginal, and evidence of serious bone disease and usually of cholesteatoma is present. In this type clinical judgment is needed. If signs of impending complications, such as pain in the head which awakens the patient from sleep, vertigo when the fistula test gives a positive result, recurring septic fever, and the like, are noted, the need for surgical intervention is obvious. The author and his colleagues have found, however, that, even with the presence of cholesteatoma, a number of these patients get along well under local medical treatment alone.

Commenting on perforations of the drumhead and on cholesteatomas, the author discusses literature reports and then points out that before introduction of the sulfonamides and antibiotics almost half of the patients with chronic suppurative otitis media seen at the Mayo Clinic had widespread destruction of the membrana tensa, with disease or scarring of the mucosa of the middle ear and cholesteatoma involving the attic, antrum, and mastoid. Lately, however, this condition is rarely seen, and the majority of patients have superior perforations leading into the attic. For the past 20 years the Bondy modification of the radical mastoidectomy was done at the Mayo Clinic. In this connection the author shows that nothing is to be gained by the preservation of the matrix of the cholesteatoma, and that in recent years he has removed this matrix. Bondy's operation combined with the Lempert flap has given excellent results. The discussions of the operative treatment for chronic mastoid bone disease in children and of operations for nonotosclerotic conduction deafness

are followed by illustrative case histories, which indicate that improvement in hearing, in addition to healing of the suppurative process, can be obtained in ears that might have been subjected previously to a classic radical mastoidectomy. Attention is directed to the importance of closure of perforations, preservation of remnants of the tympanic membrane, and replacement of the destroyed drum with a skin graft when indicated. The newer outlook on chronic suppurative otitis media has so influenced surgical technique that the so-called classic radical mastoidectomy is not indicated except in those instances in which hearing has been lost either through physiological closure of the round window by scarring or because disease has invaded and destroyed the cochlear portion of the labyrinth.

THERAPEUTICS

Treatment of Hypertension with a Combination of Chlorothiazide and Mecamylamine. A. J. Barnett and R. J. Marshall. M. J. Australia 2:521-524 (Oct. 18) 1958 [Sydney].

The value of ganglion-blocking drugs in the treatment of hypertension is limited by variability in absorption when they are given orally and by the occurrence of the unpleasant side-effects of parasympathetic ganglionic blockade. Mecamylamine represents an advance over the quaternary ammonium compounds in that it is well absorbed from the gastrointestinal tract. However, parasympathetic side-effects are no less troublesome than with the methonium drugs, and in high dosage there is a considerable incidence of diarrhea and even of necrosis of the large intestine. Since preliminary reports suggested that chlorothiazide, a new diuretic compound, enhances the activity of ganglionoplegic drugs, the authors decided to investigate the combined use of mecamylamine and chlorothiazide. Fourteen patients, all with essential hypertension, were admitted to the trial. One was a child, aged 6 years, who had previously undergone operation for suspected unilateral renal disease; the remainder, 7 men and 6 women, were aged from 36 to 63 years. In 5 of the patients malignant hypertension had been proved several years previously by the presence of papilledema. All 5 had been treated with mecamylamine for periods of 2 to 15 months before the present trial commenced, and a stable dosage had been achieved. Other patients were receiving reserpine or hydralazine. These drugs were continued, with one exception, without modification throughout the trial.

The trial confirmed the potentiating effect on the action of ganglion-blocking drugs in hypertension. During the 4-week period the dose of mecamylamine was gradually reduced in 13 of the 14 patients by approximately 50%, without any loss of the con-

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The Surgical Treatment of Chronic Suppurative Otitis Media. H. L. Williams. *A. M. A. Arch. Otolaryng.* 68:574-586 (Nov.) 1958 [Chicago].

Williams of the Mayo Clinic criticizes the suggestion made by Ballance that radical mastoidectomy with skin grafting should be done in any case

of chronic suppurative otitis media. He based this opinion on an analogy to chronic osteomyelitis of other bones. The author shows that the analogy to chronic osteomyelitis of long bones is inexact, and holds good only in the rare instances of chronic disease of the petrous apex. Ballance did not distinguish cases of perforations and simple mucoid discharge from cases of bone disease and cases in which cholesteatoma was the basis of the suppuration. Wittmaack by his theory of pneumatization provided further grounds for the tendency to operate on all types of chronically draining ears, since he suggested that the small-celled and eburnated mastoids with their pathological mucosa were doomed to continued suppuration. As a result, radical mastoidectomy was advised in cases in which the procedure added but little to the well-being of the patient. In an attempt to solve this problem, Lillie presented a classification of chronic suppurative otitis media in 1928, which, although modified from time to time, is still in use at the Mayo Clinic.

The present version of the classification into 3 types is presented, and it is pointed out that chronic suppurative otitis media of types 1 and 2 does not justify mastoidectomy. In the third type the perforation of the tympanic membrane is usually marginal, and evidence of serious bone disease and usually of cholesteatoma is present. In this type clinical judgment is needed. If signs of impending complications, such as pain in the head which awakens the patient from sleep, vertigo when the fistula test gives a positive result, recurring septic fever, and the like, are noted, the need for surgical intervention is obvious. The author and his colleagues have found, however, that, even with the presence of cholesteatoma, a number of these patients get along well under local medical treatment alone.

Commenting on perforations of the drumhead and on cholesteatomas, the author discusses literature reports and then points out that before introduction of the sulfonamides and antibiotics almost half of the patients with chronic suppurative otitis media seen at the Mayo Clinic had widespread destruction of the membrana tensa, with disease or scarring of the mucosa of the middle ear and cholesteatoma involving the attic, antrum, and mastoid. Lately, however, this condition is rarely seen, and the majority of patients have superior perforations leading into the attic. For the past 20 years the Bondy modification of the radical mastoidectomy was done at the Mayo Clinic. In this connection the author shows that nothing is to be gained by the preservation of the matrix of the cholesteatoma, and that in recent years he has removed this matrix. Bondy's operation combined with the Lempert flap has given excellent results. The discussions of the operative treatment for chronic mastoid bone disease in children and of operations for nonotosclerotic conduction deafness

are followed by illustrative case histories, which indicate that improvement in hearing, in addition to healing of the suppurative process, can be obtained in ears that might have been subjected previously to a classic radical mastoidectomy. Attention is directed to the importance of closure of perforations, preservation of remnants of the tympanic membrane, and replacement of the destroyed drum with a skin graft when indicated. The newer outlook on chronic suppurative otitis media has so influenced surgical technique that the so-called classic radical mastoidectomy is not indicated except in those instances in which hearing has been lost either through physiological closure of the round window by scarring or because disease has invaded and destroyed the cochlear portion of the labyrinth.

THERAPEUTICS

Treatment of Hypertension with a Combination of Chlorothiazide and Mecamylamine. A. J. Barnett and R. J. Marshall. M. J. Australia 2:521-524 (Oct. 18) 1958 [Sydney].

The value of ganglion-blocking drugs in the treatment of hypertension is limited by variability in absorption when they are given orally and by the occurrence of the unpleasant side-effects of parasympathetic ganglionic blockade. Mecamylamine represents an advance over the quaternary ammonium compounds in that it is well absorbed from the gastrointestinal tract. However, parasympathetic side-effects are no less troublesome than with the methonium drugs, and in high dosage there is a considerable incidence of diarrhea and even of necrosis of the large intestine. Since preliminary reports suggested that chlorothiazide, a new diuretic compound, enhances the activity of ganglionoplegic drugs, the authors decided to investigate the combined use of mecamylamine and chlorothiazide. Fourteen patients, all with essential hypertension, were admitted to the trial. One was a child, aged 6 years, who had previously undergone operation for suspected unilateral renal disease; the remainder, 7 men and 6 women, were aged from 36 to 63 years. In 5 of the patients malignant hypertension had been proved several years previously by the presence of papilledema. All 5 had been treated with mecamylamine for periods of 2 to 15 months before the present trial commenced, and a stable dosage had been achieved. Other patients were receiving reserpine or hydralazine. These drugs were continued, with one exception, without modification throughout the trial.

The trial confirmed the potentiating effect on the action of ganglion-blocking drugs in hypertension. During the 4-week period the dose of mecamylamine was gradually reduced in 13 of the 14 patients by approximately 50%, without any loss of the con-

trol of blood pressure. The diminution in requirement of mecamlamine was accompanied by decrease in most of the symptoms attributable to parasympathetic ganglionic blockade, with the exception of dryness of the mouth, which was sometimes unchanged or even worse; it seems that the effects of mild dehydration induced by chlorothiazide may counterbalance the benefit from reduced dosage of mecamlamine. The potentiating effect of chlorothiazide was noted within 2 or 3 days. Several patients showed severe postural hypotension at this time. The fall in body weight occurred within the first week. The effect of chlorothiazide disappeared soon after the drug was withdrawn. In one patient severe headaches from uncontrolled hypertension developed 3 days after the end of the trial.

Estimations of electrolyte levels should be made at intervals during prolonged treatment, especially in patients with renal impairment, to guard against possible serious derangements. It seems unwise to give more than 1 Gm. of chlorothiazide daily and unnecessary to restrict dietary sodium intake. No toxic effects have been reported. The mode of action of chlorothiazide as a hypotensive agent has not yet been fully elucidated, although its major effect probably occurs through a reduction in plasma volume secondary to loss of salt and water. Its efficacy in enhancing the potency of ganglion-blocking drugs, permitting the latter to be used in lower dosage with less unpleasant side-effects and dangerous complications, is established.

A Comparative Evaluation of Certain Methods of Vaccine Therapy in Brucellosis. T. L. Bereznyakova. *J. Microbiol.* (Translation from the Russian) (no. 9-10) 28:1229-1233, 1957 [New York].

A polyvalent bacterial vaccine, consisting of heat-killed *Brucella* organisms, was given by 3 routes to 335 patients with brucellosis. The vaccine was administered subcutaneously to 107 patients, intravenously to 183, and intracutaneously to 45. Most of the patients were between 21 and 50 years of age. The disease had developed in the digestive tract of approximately two-thirds of the patients, and it was attributed to the patients' occupation [such as the herding of cattle] in the others. The chronic phase of the disease was present in 255 patients (76.42%). Joints, central or peripheral nervous system, and internal organs were involved in descending order in a number of patients affected. The subcutaneous method of vaccination was not well tolerated, and it was abandoned in 1951. The best results were obtained with the intravenous method, the vaccine being administered daily in 2 or more doses at intervals of 1½ to 2 hours. The optimum dose consisted of a solution containing 100,000 killed bacterial cells. Administration of divided doses permitted decreasing considerably the over-

all dosage. The best therapeutic effect and the least frequent recurrences were related to the 2-part intravenous administration of the vaccine. There was a rapid restoration of body temperature to normal after 4 or 5 intravenous injections, whereas this effect did not develop with the other 2 methods until after 8 to 12 injections. Improvement in the general condition and subsidence of joint pains and other symptoms took place more rapidly with the intravenous method (usually after a few days of therapy) than with the other 2 methods. The only complication ascribed to the intravenous route was the exacerbation of a preexisting state of nephritis in one patient. The intracutaneous route may be used only in selected instances in which it is desirable to avoid the generalized postvaccinal pyretic reaction.

Catastrophic Drug Reactions. L. E. Prickman. *Minnesota Med.* 41:751-753 (Nov.) 1958 [St. Paul].

Frightening experiences with severe status asthmaticus, which followed the inadvertent administration of acetylsalicylic acid (aspirin) to patients with asthma and nasal polyps who were sensitive to this drug, led to a careful questioning of each patient about this and other drug hypersensitivities. When the history of any drug allergy was obtained, the author promptly stamped the words "drug allergy" on all parts of the patient's records to alert all concerned not to administer this particular agent; this device worked extremely well. Then, as allergic sensitivity to sulfonamides, penicillin, and many other new drugs was encountered, the Mayo Clinic history records were revised to provide a special space in which to record the presence or absence of any known drug allergy and the type and severity of the reaction. This same information about drug allergy was also recorded on cards referring the patient to the hospital in order to alert surgeons, anesthesiologists, nurses, and the staff generally, so that the offending medicament would not be administered. Similar precautions were taken with contrast mediums and anesthetic agents.

A careful history will not reveal all potential allergic reactions; nor are reliable tests available for the detection of all drug hypersensitivities. Case histories are presented to illustrate this, and a survey on severe reactions to antibiotics is cited. The physician must be ready at all times to treat allergic drug reactions quickly and effectively. Fortunately, the agents most needed to cope with such emergencies are to be found in most physicians' bags. Unfortunately, these agents are not always assembled and immediately available in hospitals and clinics. Therefore, emergency sets have been prepared to combat anaphylaxis. These sets are placed in strategic locations in clinics, hospitals, and research departments where one is most

likely to encounter anaphylactic reactions. The sets contain two 1-ml. ampuls of epinephrine (1:1,000), two ampuls of aminophylline (3¼ grains [0.25 Gm.] each), one 1,000-ml. bottle of 5% dextrose in distilled water, one 10-ml. ampul of diphenhydramine (Benadryl) hydrochloride (10 mg. per milliliter), and one bottle of hydrocortisone (100 mg.), together with various syringes, long and short needles, scalpel, hemostat, suture material, alcohol, sponges, and a set for the intravenous administration of fluids. Oxygen (tank and mask) is also important and is readily available in clinics and hospitals. Most reactions encountered are mild and respond to injections of epinephrine and oral therapy with antihistamines. Penicillinase, an enzyme that promptly neutralizes penicillin *in vivo*, is also available but has not been tested by the author. Because it is said to have sensitizing potentialities, its use perhaps should be reserved at present for major reactions to penicillin until its safety can be further studied.

PATHOLOGY

A New Method for Blood Cell Counting. I. E. Roeckel. *Bull. Georgetown University Med. Cent.* 12:60-61 (Nov.) 1958 [Washington, D. C.].

In an attempt to find a reliable but more rapid means of counting both red and white blood cells, an electronic counter was substituted for the technician's hand at the Georgetown clinical laboratory. The counter used is based on the principle that blood cells are poor electrical conductors in comparison with a sodium chloride solution, thus allowing a controlled electric current to distinguish them. The procedure for the white blood cell count is as follows. A predetermined, optimal dilution of blood is made in isotonic sodium chloride solution; the red blood cells are completely disintegrated with the aid of a stromalizing agent and placed in a beaker. Through an aperture exactly 0.5 cc. of the blood cell suspension is drawn while the electric current flows from the positive to the negative electrode. The blood cells passing through the aperture interrupt this flow of current, and these interruptions are counted by a high-speed electronic computer. At the same time the electric impulses resulting from the individual blood cells are displayed on an oscilloscope screen directly visualizing the counting process. This permits a continuous check on the performance of the machine. The absolute number of white blood cells counted by the machine is shown on the computer and for a normal leukocyte count is about 20,000 blood cells as compared with a hand count of about 20 blood cells. The absolute number of white blood cells counted as well as the simple diluting technique accounts for the greater accuracy. Red blood cells are counted in a similar manner, omit-

ting the stromalizing agent and increasing the dilution with sodium chloride solution. Four months' intensive use of the electronic counter has shown the instrument to be reliable, accurate, and efficient, as well as economical.

A Study of the Adrenal Status in Hypertension. A. H. Shamma, J. W. Goddard and S. C. Sommers. *J. Chron. Dis.* 8:587-595 (Nov.) 1958 [St. Louis].

The role of the adrenals in essential hypertension is still controversial. The weights, lipid content, and structural abnormalities of the adrenals were studied in 78 hypertensive patients who had undergone a therapeutic unilateral or bilateral adrenalectomy, and also in 220 hypertensive patients examined at autopsy. The findings were compared with those from 220 normotensive patients who came to autopsy. Adrenocortical adenomas were found in 45 (20%) of 220 autopsied cases with hypertension. There were 16 true adenomas (21%) among the 78 adrenalectomy specimens. In the control series adenomas were present in 4 (1.8%) of 220 cases. Thus, adrenocortical adenomas were 10 times more frequent in hypertensive than in normotensive persons.

Only 3 of the 61 adenomas were recognized clinicopathologically as functional tumors of etiological importance in hypertension, with aldosterone hypersecretion. In most adrenalectomy specimens from patients with essential hypertension, cell counts demonstrated no hints of hyperactivity of either zona glomerulosa or zona fasciculata. In fact, the glomerulosa cells instead were relatively close-packed, with an inferred hypoactivity of the type observed to occur when the intercellular fluid is comparatively rich in sodium. From the viewpoint of these cell counts, corticoids are not likely to be implicated in causing human essential hypertension. Medullary hyperfunction of adrenal glands in hypertension could also not be inferred from the present observations. Failure to demonstrate significantly increased adrenal weights accompanying hypertension does not necessarily exclude an overgrowth of one component of this compound endocrine gland at the expense of others. If adrenocortical adenomas, cortical nodules, and nodular cortical protrusions are all regarded merely as different manifestations of adrenocortical overgrowth, then more than 80% of adrenalectomized or autopsied hypertensive cases had excessive cortical growth, compared with about 44% of the control cases. Adrenal weights, lipid content, venous wall thickness, and other morphologic aspects investigated were not significantly different in the hypertensive and control series. The authors feel that more refined methods of analyzing the various adrenal components would be necessary to establish the importance of adrenocortical tissue growth activity accompanying hypertension.

Skin Fragments Removed by Injection Needles. T. Gibson and W. Norris. *Lancet* 2:983-985 (Nov. 8) 1958 [London].

The authors investigated the incidence, the cause, and the possible fate of skin fragments cored out when a hollow needle is thrust through the skin. Portions of skin and subcutaneous tissue were obtained at autopsy or from surgically excised material. All needles in the range commonly used for intravenous injections—from the standard needle (18 gauge) included in the set used by the blood transfusion service to a no. 16 hypodermic needle (24 gauge)—were tested. Some needles removed fragments of skin at each thrust, others only sporadically. Of 300 tests with all needles, fragments of skin were removed in 207 (69%). No difference was noted between new and resharpened, open-ended needles, nor did the various needle sizes make any difference as to the number of skin fragments removed. The size of the skin fragment was roughly proportional to the size of the lumen. Needles with a closed end (side-opening needles and those with a fitted stylet) did not remove skin fragments. The fact that no harmful effects have been previously attributed to skin emboli suggests that little is to be feared from that source. With more widespread awareness, the high incidence of detached portions of skin may be correlated with pathological processes. The risk of infection, subcutaneous, intramuscular, or pulmonary, calls for care in skin preparation before injection.

PHYSIOLOGY

Fatal Effects of Heat on Man. M. A. Haseeb and F. Amin. *J. Trop. Med.* 61:280-281 (Nov.) 1958 [London].

The disaster reported occurred in the Sudan Republic in February, 1956, when 281 prisoners were confined in a prison ward of a dimension ordinarily allotted to 16 soldiers. The prisoners entered the ward, measuring 19 to 5.5 meters (about 60 by 17 ft.) and 3.8 meters (12 ft.) high, at 7:30 p.m. after an exhausting 8-hour journey in trucks on a day when the maximum temperature was 103.8 F (40 C). They probably had very little to eat and drink during the previous 24 hours. On opening the ward in the morning, 187 persons were found dead, and 11 persons were seriously ill with shock, thready pulse, and vomiting. Two of the 11 died on the way to the hospital, and 5 others died on the day of admission. All 9 persons who arrived at the hospital had hyperpyrexia, with an average temperature of 102 F (38.9 C), thready pulse, sunken eyes, dry lips, dry wrinkled skins, and sighing respiration, and were either comatose or semicomatose and in a state of muttering delirium.

The 83 prisoners who survived and were not hospitalized revived like "fish put back into a stream" when buckets of water were poured on their bodies. Vomiting was such a marked symptom of the sick that the police suspected poisoning. The experiences of the prisoners were described as follows: "Within one hour of being locked in, everyone felt uncomfortably hot, so much so that they stripped off almost all their clothes. Throbbing headache, palpitation, nausea, and a feeling of extreme fatigue and helplessness supervened. They became giddy and unable to stand or even to move their limbs. Sweating was so profuse and persistent that the floor of the ward was flooded. There was a feeling of impending death and the people started shouting for help but their voices were faint and inaudible. Collapse and death followed." Postmortem examinations were performed on 4 bodies: The eyes were open, the eyeballs depressed, and the lips dry; the skin and muscles were extremely hard to cut; all the internal organs looked pale and felt as hard as wood; there were no specific pathological lesions in any organ. This extreme example of the effect of heat on the human body is reminiscent of the "Black Hole" of Calcutta during the revolution in Bengal in June, 1756, when 146 Englishmen were arrested and confined in the punishment cell of the Fort, a room about 18 by 14 ft. with only one small window. Only 23 of them came out alive.

BIOCHEMISTRY

The Ionized, Complexed, and Protein-Bound Fractions of Calcium in Plasma: An Investigation of Patients with Various Diseases Which Affect Calcium Metabolism, with an Additional Study of the Role of Calcium Ions in the Prevention of Tetany. A. Fanconi and G. A. Rose. *Quart. J. Med.* 27:463-494 (Oct.) 1958 [London].

There are 3 main forms in which calcium may appear in the plasma: ionized, protein-bound, and complexed. In this report the term "complexed" refers to that fraction of calcium which is ultrafilterable but not ionized. Most of this calcium is complexed to small diffusible molecules, the chief of such molecules being citrate. The only accepted method of determining the ionized calcium of plasma has been the biological method of McLean and Hastings, which uses the frog heart as an indicator for calcium ions. Unfortunately in patients with pathological conditions unknown substances may be present in the plasma, or known substances may be present in abnormal concentration. In particular, magnesium ions or organic acids may be present in abnormal concentration and may affect the frog heart.

A purely chemical method which permits the determination of ionized and ultrafilterable calcium in human plasma was described by Rose in 1957.

It is not susceptible to the hazards of the biological method. This method, with certain modifications, was used by the authors who report the results of 66 determinations of plasma-ionized, of plasma-complexed, and of total plasma calcium in 7 normal men and in 37 patients with pathological conditions affecting calcium metabolism. In normal men the total plasma calcium content ranged from 9.17 to 10 mg. per 100 cc. In primary hyperparathyroidism the level of plasma-ionized calcium was high, whereas in secondary hyperparathyroidism it was normal or low. There was some evidence that in primary hyperparathyroidism the binding of calcium by plasma proteins is lower than might be expected. This explains why some patients with parathyroid adenomas have normal levels of total plasma calcium. As was expected, the plasma-ionized calcium was diminished in hypoparathyroidism.

In 2 of 3 cases of uncomplicated nephrotic syndrome, the level of plasma-ionized calcium was normal, the diminished concentration of total plasma calcium being entirely due to a decrease in the protein-bound fraction associated with a low level of plasma albumin. In the third case, the ionized fraction was diminished. In patients with untreated renal glomerular osteodystrophy, the level of plasma-ionized calcium was low or normal; this value is a good guide for controlling the dose of vitamin D required to heal bone disease. In 2 untreated cases of renal tubular rickets and osteomalacia, the level of plasma-ionized calcium was normal; there was no tendency to a low level of this form, as implied by other workers. In steatorrhea the level of plasma-ionized calcium was low in patients in whom it was suspected that osteomalacia was developing.

Overbreathing in normal subjects was followed by a decrease in the plasma-ionized calcium. Nearly half of this decrease was due to an increase in the plasma-complexed calcium, the remainder being due to an increase in calcium bound to plasma protein. Four patients were investigated who had chronic signs of tetany or pretetany in the presence of normal plasma electrolytes. All had normal plasma calcium fractions and showed a normal decrease in the ionized fraction after overbreathing.

There was evidence that in cases of renal failure with hypocalcemia, but without tetany, the absence of tetany is not due to acidosis alone. Protection must sometimes be due mainly to some other factor, which may be an increase in plasma magnesium. In hypoparathyroidism tetany occurred when the plasma-ionized calcium fell below a critical level of approximately 4.3 mg. per 100 cc., provided that there were no other complicating factors. The level of plasma-complexed calcium was high in alkalosis from overbreathing, and in renal failure when the blood urea exceeded approximately 100 mg. per 100 cc. It was normal, however, in primary hyperparathyroidism uncomplicated by

severe renal failure. In the absence of marked renal glomerular damage the urine calcium appeared to be related closely to the plasma-complexed calcium. There is some evidence that there are 2 immediate causes of the high level of urine calcium in idiopathic hypercalciuria. Either there is an excess of complexed calcium in the plasma, or else there is a diminished renal tubular reabsorption of a complex of calcium.

The Normal Range of Transaminase Levels. G. L. Reyes. J. Philippine M. A. 34:537-540 (Sept.) 1958 (In English) [Manila].

The author determined the levels of glutamic oxalacetic transaminase (GO-T) and glutamic pyruvic transaminase (GP-T) in blood samples obtained from 200 adult Filipinos, 150 men and 50 women, *between the ages of 18 and 42 years*. The serum transaminase values ranged from 5 to 38 units for GO-T and from 3 to 29 units for GP-T, with mean or average values of 13.84 ± 6.63 and 14.78 ± 6.06 Sigma Frankel units respectively. Comparison of the difference of the mean values of serum and plasma and the standard error of the difference between the two mean values for each type of transaminase showed that the results obtained for serum and plasma were statistically significant, and, therefore, serum and plasma cannot be used interchangeably in determining GO-T and GP-T values.

PUBLIC HEALTH

The Problem of the Dissemination of Poliomyelitis Virus in the Environment of the Patient Between Epidemics. E. S. Zalmanzon, R. S. Rappoport, F. G. Itselis and A. F. Talinskaia. Probl. Virol. (no. 5-6) 2:348-353, 1957 (Translation from the Russian) [New York].

At the Urban Public Health and Epidemiologic Station in Moscow, the authors studied the problem of determining the degree of dissemination of poliomyelitis virus in the environment of patients between epidemics. Seven hundred twenty-one persons who had been in contact with poliomyelitis patients under various environmental conditions from January to May, 1956, were examined for virus. In 15 of 45 various locations (14 nurseries, 5 kindergartens, 2 schools, and 24 domestic environments), a total of 37 strains of poliomyelitis virus were isolated; 20 of them were type 1, 7 were type 2, and 10 were type 3. Type 1 virus was found in 7 locations, type 2 in 3, and type 3 in 5. This makes it probable that during the winter and spring of 1956 there were sporadic cases of poliomyelitis in Moscow, since during epidemic outbreaks one type is predominantly isolated, usually type 1 virus. Only untypable cytopathogenic agents were found in 6 environmental locations, and the virus was not

found in 24. If, of the 721 persons only the 358 in the 15 locations in which poliomyelitis virus was isolated are considered, then its dissemination in the environment of patients amounts to 10.3% (37 strains from 358 persons investigated).

The virus was isolated in 10% of infants up to 3 years of age, in 1.3% of children from 3 to 7, in 1.9% of children from 7 to 15, and in 0.5% of persons over age 15. Untypable cytopathogenic agents were found exactly twice as frequently as poliomyelitis virus. The percentage isolation of poliomyelitis virus in the environment of patients was significantly lower in this investigation than in previous ones. This could depend on 3 causes. 1. The present investigation was not carried out during an epidemic, but, was made while the dissemination was at its lowest intensity. 2. Cultures of human embryonic tissues were used, which are less sensitive to poliomyelitis virus than are the cultures of HeLa cells or of monkey kidney tissues used by other authors. 3. The amount of fecal suspension added to the culture medium varied from 0.1 to 0.2 cc.; the percentage of isolations of the virus might possibly have been raised by increasing the amount of introduced material. The authors found a greater dissemination of poliomyelitis virus in children's institutions, particularly nurseries, than in a family environment. Type 3 poliomyelitis virus was discovered for the first time within the Soviet Union.

Organization of the Treatment of Tuberculous Meningitis in Czechoslovakia and Results. L. Kladi-vova, V. Vojtek and F. Sykora. *Arch. franç. pédiat.* (no. 7) 15:941-946, 1958 (In French) [Paris].

The authors present precise data concerning all the children in Czechoslovakia, up to age 15 years, who were afflicted with tuberculous meningitis between January, 1954, and December, 1956. These data were collected from 5 state centers for treatment of the disease, each of which was responsible for the results of early and late treatment of every case of meningitis in the region assigned to it. The frequency of meningitis is decreasing because of vaccination against tuberculosis with BCG, a practice which has been systematically carried out in all regions since 1954. The effectiveness of the vaccine is clearly proved by the fact that only 4.5% of the children with meningitis had been vaccinated and that 95.5% had not been vaccinated. Vaccination reduced the number of cases of meningitis among infants under 2 years of age from one-third to one-fifth of the total number of cases. The mortality rate for all ages fell during the 3-year period from 42 to 18%. The authors attribute this decrease to the standardization of treatment throughout the republic. The essential medicament is isoniazid which is given orally in a daily dose of 15 to 20 mg. per kilogram of body weight for at least 6 months; after that the child is given 5 mg. per kilogram daily

until he leaves the sanatorium. Streptomycin and aminosalicylic acid are also administered. Hormone therapy is given during the first 10 days of treatment. Earlier diagnosis and treatment resulted in a reduction in the number of children having coma or obtundation at the beginning of treatment from 47 to 34%. Improvement in treatment increased the number of cures without serious sequelae from 48% in 1954 to 72% in 1956.

An Evaluation of Tuberculosis Case Finding by Tuberculin Testing and Some Observations of Histoplasmin Sensitivity Among Young School Children. L. E. Wood, M. L. Furcolow and M. J. Willis. *Am. Rev. Tuberc.* 78:667-681 (Nov.) 1958 [New York].

The authors performed 66,033 tuberculin and histoplasmin skin tests annually with particular reference to the annual prevalence rates for tuberculin and histoplasmin sensitivity, as well as conversion rates for these antigens, among 51,040 kindergarten children in Kansas City, Mo., between 1947 and 1957. Of the 66,033 children, 35,995 were tested for the first time in kindergarten, and 15,045 received their first test while in the first grade and were not retested; 14,993 kindergarten children whose first skin tests were negative were retested the following year. A child whose skin test was negative one year and positive the next year was classified as a converter. The tuberculin employed in this study was purified protein derivative. The histoplasmin used was Lot H 42 in a 1:100 dilution. All tests were administered intracutaneously.

Of the 35,995 kindergarten children tested, 29,632 were white children and 6,363 were Negroes. Concerning the over-all tuberculin sensitivity rates, Negroes predominated over whites in a ratio of 2.6 to 1.5%. In contrast, the histoplasmin sensitivity rates were higher for white children than for Negroes, the ratio being 10.4 to 8.7; however, subsequent annual rates for white children showed a decrease, while those for Negroes increased, so that for the final 2 years of observation they were almost the same. Of the 14,993 children whose tuberculin tests were negative in the kindergarten and who were retested one year later in the first grade, 12,253 were white children and 2,740 were Negroes. Again, the percentage of tuberculin converters was higher among Negroes than among whites, the ratio being 1.4 to 1.0%. The histoplasmin conversion rates too were higher among the Negro children, the percentage for Negroes being 4.7% and for white children 2.6%. The tuberculin conversion rates observed among children who were non-reactors in kindergarten did not show a tendency to fall during the entire observation period.

The data concerning the yield of tuberculosis among the contacts of 155 tuberculin converters and 833 children who were reactors on the first

test in both white and Negro contacts (adults and children) show that an average of about 6 contacts for each converter and $4\frac{1}{2}$ for each child who was a tuberculin reactor on the first test were followed. The average yield of new active, previously unknown cases of tuberculosis (1.2%) was the same for the converters as for those who were reactors on the first test. The yield of known tuberculosis among the contacts of children who were tuberculin reactors at the time of entrance to kindergarten was almost twice that of the converters (4.1 to 2.3%). The number of new active cases of tuberculosis was a little higher among contacts of Negro children than among those of white children; however, the yield of known tuberculosis among the Negroes was almost twice that of the yield among the whites. The increase in new, previously unknown cases of tuberculosis was almost twice as high among household contacts as among non-household contacts (1.4 to 0.8%); however, known tuberculosis was found to be much more prevalent among nonhousehold contacts (5.4%) than among household contacts (2.7%). The yield of tuberculosis among contacts rose steadily as the size of the reaction of the index child increased. Thirty times as much new tuberculosis was found among contacts of children whose tuberculin reaction exceeded 25-mm. induration as among those whose reaction was 5 to 9 mm.

This survey revealed that the percentage of children infected with tubercle bacilli at the time of school entrance is the same now as it was 10 years ago. These relatively constant annual prevalence and conversion rates for tuberculin sensitivity should represent a reasonably accurate index of tuberculosis control within the city. Use of the tuberculin test for obtaining index children, whose contacts form a special risk group for extensive follow-up study, not only gives a better yield of tuberculosis cases than mass roentgenography but also at the same time decreases the total exposure of a population to ionizing radiation.

Accidental Home Poisonings. D. Kubryk and A. C. McKenzie. *Canad. J. Pub. Health* 49:420-424 (Oct.) 1958 [Toronto].

The authors carried out an epidemiologic study of 275 accidental home poisonings which occurred in the area of Ottawa between 1956 and 1958. Of the 275 accidents, 259 occurred in children (151 boys and 108 girls) less than 5 years old. Of the remaining 16 accidents, 7 occurred in children between the ages of 5 and 10 years, and 9 occurred in children over 10 years of age. Of the 275 patients, 31% spent one day or more in the hospital; 13 of these were hospitalized for 10 days or more. Acetylsalicylic acid tablets were the commonest single substance responsible for these accidents, with household preparations and solvents next in order.

Carelessness was considered to be a factor in 83% of the poisonings, and 90% of the poisonings were considered preventable. Little can be done about the inherent curiosity of young children, but the evidence seems to indicate that continued education directed to the parents of such children would greatly reduce the number of these accidental home poisonings.

Sensitivity to Tuberculin, Histoplasmin and Coccidioidin Among High School Students in Northwestern Georgia. P. Q. Edwards, C. F. Jacobs and D. Barfield. *Dis. Chest* 34:467-483 (Nov.) 1958 [Chicago].

The authors report the results of a skin-testing survey with histoplasmin, coccidioidin, and tuberculin, supplemented with 70-mm. photofluorograms of the chest, which was carried out by the Public Health Service among students attending the 6 public high schools in Whitfield and Murray counties, Georgia. About 90% of the total estimated enrollment of 2,400 students participated in the survey. There was a striking reversal of the usual rural-urban pattern of prevalence of sensitivity to histoplasmin. Students living in the urban area of Dalton had a reaction rate of 55%, as compared with a rate of 22% for those living in rural areas. Pulmonary calcifications were observed in about 12% of the histoplasmin reactors. Analysis of the findings has led directly to the hypothesis that there may be a source of histoplasmal infection within the city of Dalton which has been present for at least several years.

About 5% of the white students had reactions interpreted as positive to the 5 T. U. (0.0001 mg.) dose of purified protein derivative of tuberculin, with only small variations of that average from school to school and between boys and girls. The rates were slightly higher for the older students, as compared with those for the younger students, within the 6-year age span from 14 to 19 years. Coccidioidin reactions, which were of small average size, were interpreted as nonspecific (or cross) reactions owing to histoplasmal infection.

Clearly histoplasmosis is an infection to be reckoned with in this urban community. Abnormalities in the chest roentgenograms of these young persons are far more often a result of histoplasmal than tuberculous infection. As an immediate consequence of the survey, a systematic search has been started through the health department's tuberculosis case register for persons with histoplasmosis misdiagnosed as tuberculosis. Skin testing with histoplasmin as well as tuberculin has been instituted in the clinic work. Tuberculosis is still the main problem, but the frequency of tuberculin reactors among these high school students indicates that the infection rate at the present time may be considered lower than 3 per 1,000 per year.

BOOK REVIEWS

The Amphetamines: Their Actions and Uses. By Chauncey D. Leake, Ph.D., Professor of Pharmacology, Ohio State University, Columbus. Publication number 338, American Lecture Series; monograph in Bannerstone Division of American Lectures in Pharmacology. Edited by Chauncey D. Leake. Cloth. \$4.50. Pp. 167. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This is an interesting, expertly written summary of the significant biological and chemical aspects of the amphetamines. Special emphasis is given to the three members of this group most widely used in medical practice: amphetamine sulfate, dextro-amphetamine sulfate, and methamphetamine hydrochloride. The book is designed chiefly for use by practicing physicians, but it should also aid others associated even indirectly with the medical profession. In a touching dedicatory preface Dr. Leake pays well-deserved tribute to Dr. Gordon Alles who synthesized amphetamine in 1927 and made the original pharmacological studies on it. There are chapters on the history, source, and physical properties of the amphetamines; their absorption, fate, and excretion; their pharmacology and toxicology; their therapeutic applications (this is the subject of the longest chapter); and the sociological impact of their use and abuse. While about 300 references are listed, the book does not purport to be a detailed review. It is satisfactorily indexed and is written for quick and pleasant reading. This book is recommended to all physicians and to any others who wish to know the current status of this important group of drugs.

The Medical Management of Cancer. By Henry D. Diamond, M.D., F.A.C.P., Associate Attending Physician, Medical Neoplasia Service of Department of Medicine, Memorial Center for Cancer and Allied Diseases, New York City. Modern medical monographs 15. Editor in chief: Irving S. Wright. Consulting editor: Richard H. Orr. Cloth. \$6.75. Pp. 179, with illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

This small volume contains a wealth of information for the practicing physician, representing the distillation of some 12 years of the author's experience on the medical service of the Memorial Center for Cancer and Allied Diseases in New York. Combined with this has been his complementary function as an associate of the Sloan-Kettering Institute of the Center, where he is responsible for developmental work in chemotherapy of the lymphomas. His experience as investigator and clinician com-

bined with an admirable knowledge of the natural history of cancer is reflected in the pages of this monograph. The author has achieved his announced objective of maintaining brevity without sacrifice of precision. The few omissions which are apparent are so lacking in importance as to underscore the author's total success. The content is outstanding but the organization of the book is defective in some respects. This is most apparent when, with no general discussion or orientation concerning features which are common to most or all of the forms of cancer under discussion, the author immediately launches into a discussion of the malignant lymphomas. Thus the first and in some cases the only description of such factors as surgical considerations, irradiation, and tabulation of the various polyfunctional alkylating compounds appears to be the peculiar property of the chapter on malignant lymphomas. This failure to provide a preliminary consideration of such factors and their general use is compensated for, to some extent, by the uniform treatment of each entity throughout the book, including etiology and incidence, pathology and natural history, diagnostic and pathological physiology, and treatment.

There are many effective and varied illustrations which include structural identifications of the various compounds listed as chemotherapeutic agents. Just as the sections on the background and development of each disease are lucid, the discussion of treatment is extremely practical, with special listing of the many facets of involvement and their need for recognition and management, as, for example, in Hodgkin's disease. The book is divided into two main groupings of the diseases discussed. More than half of the volume is devoted to the malignant lymphomas, the leukemias, and plasma cell myeloma, all cancers in which the primary treatment is medical. The remainder of the book is concerned with medical management of cancers in which the primary treatment is surgical, these neoplasms including neuroblastoma and cancer of the lung, thyroid, ovary, breast, and prostate. Under cancer of the breast, somewhat unjustifiable prominence seems to be ascribed to the use of androgens at the expense of oophorectomy for premenopausal women. The format of the book is excellent. At the end of each chapter there is a well-chosen list of references. A useful appendix discusses the intracavitary injection of radioisotopes, with an impressive bibliography. This volume should be of the greatest value to anyone who treats patients with incurable cancer, be he senior medical student, intern, general practitioner, or specialist.

The Teaching and Learning of Psychotherapy. By Rudolf Ekstein, Ph.D., and Robert S. Wallerstein, M.D. Cloth. \$6.50. Pp. 334. Basic Books, Inc., 59 Fourth Ave., New York 3, 1958.

The authors have tackled the elucidation of the difficult problems of training in psychotherapy. No satisfactory model for supervision has yet been universally acclaimed in the many existent training centers for psychiatrists, social workers, or psychologists who are learning the processes of psychotherapy. The problems involved are represented by a clinical rhombus which involves the administrators, the supervisors, the therapists, and the patients. The authors attempt to understand the various interactions among these four foci of persons involved in learning and teaching. Under four main headings, entitled (1) The Training Setting; (2) The Beginning Phase; (3) The Learning Process; and (4) The End Phase, various problems of interaction between teacher and student are thoroughly considered. Each section includes examples taken from real situations as experienced by the authors. Their examples are lucid and clearly expose the many problems involved in teaching and learning psychotherapy. All psychiatrists who are naturally involved either as administrators, therapists, or supervisors will find much in this book that attempts to clarify the many doubts raised in these various roles. However, the book does not attempt to cover the problems of technique and, therefore, does not teach psychotherapy. This is a slow and tedious process which must be experienced over long periods of time by the various learners in this field. Neither does the book undertake to teach supervision, which also requires a lengthy learning process. There is an excellent bibliography and a satisfactory index. The book is highly recommended for use in the various training centers.

The Borderland of Embryology and Pathology. By R. A. Willis, D.Sc., M.D., F.R.C.P. Cloth. \$18. Pp. 627; 33, with 244 illustrations. Butterworth & Co. (Publishers) Ltd., 88 Kingsway, London, W. C. 2, England; 1367 Danforth Ave., Toronto 6, Canada, 1958.

Those who have felt concern over the increasing pressures to dispense with comparative anatomy and embryology as requirements for admission to medical school will find no comfort in this book. For over 600 pages the author documents various problems in medicine which are explained at least in part by an understanding of embryology. The author assumes only a modest knowledge of embryology on the part of the reader and devotes the opening chapters to a description of the early development of the human embryo and the structure and function of embryonic tissues as well as some of the more recent contributions of experimental embryology. He then discusses malformations, indicating the importance of developmental arrest and differential susceptibility in the various types. Both

environmental and genetic causes are considered before showing the relations of malformations to various clinical conditions, many of which are not commonly realized to have an embryonic basis, such as neurofibromatosis, muscular dystrophies, and tuberous sclerosis. Many congenital anomalies are explained by developmental vestiges or developmentally heterotopic tissues and, since these conditions are familiar to the clinician, they are covered rather quickly in this volume. In the chapter entitled "Hamartomas and Hamartomatous Syndromes" the author emphasizes the pathology of the conditions with little reference to a possible embryologic explanation. Inborn metabolic disorders are treated cursorily but are supported by an extensive and current bibliography. The discussion of embryonic tumors and teratomas is excellent, as might be expected; for it is in this sphere that much of Dr. Willis' earlier work was done. His discussion of embryonic tumors from an embryologic and histogenetic basis should do much to clarify the confused ideas that many have regarding these tumors.

A discussion of non-neoplastic diseases of the fetus, such as viral, bacterial, nutritional, or endocrine diseases and the effects of drugs or poisons, emphasizes the importance of maternal conditions in modifying fetal development and causing disease in the fetus. The volume concludes with a discussion of regeneration and repair as a function of resumed embryonic growth and a chapter on metaplasia. A short chapter on transplantation and tissue culture appears to have been added somewhat as an afterthought. While this is a survey of the field of tissue culture, it does not add appreciably to the value of the book. It is fortunate that one of the world's most outstanding pathologists should have written a volume on one of medicine's most challenging problems, the control and repair of congenital defects. There can be no question of Dr. Willis' competence to write such a volume. This book can be unhesitatingly recommended to pediatricians, surgeons, pathologists, and anyone with an interest in congenital anomalies.

The Practical Use of the Microscope Including Photomicrography. By George Herbert Needham, M.S., F.R.M.S., Lecturer in Microscopy and Photomicrography, University of California Medical School, University Extension, San Francisco. Cloth. \$15.50. Pp. 493, with 173 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

The title of this volume gives an accurate description of its content, since the author has succeeded in making this book on microscopes practical from the standpoint of both the proper use of the various instruments on the market and their limitations. Constructive criticisms of instruments and their

limitations is desirable in any publication describing different types of equipment, provided it is done impartially and adequately. The author has organized the book to start with the simple and proceed to the complex aspects of the subject so that it may be of value to the beginner as well as to the more advanced reader. A brief introduction on the evolution of the microscope is followed by 11 chapters on the various classes or types of microscopes. These include simple and compound microscopes, binocular and wide field binocular microscopes, comparison, fluorescence, electron, phase contrast, and polarizing microscopes, near ultraviolet, ultraviolet, and reflecting microscopes, and slit, immersion, and reflecting ultramicroscopes. In these chapters the author has usually included a general discussion of the basic instrument, the manner in which the instrument is to be used, the field of usefulness, the advantages and disadvantages of the instrument, and a discussion of the various makes of instruments available.

The chapter after the one on polarizing microscopes includes material on the determination of optical constants of crystalline materials. The optics of the microscope are discussed in a single chapter followed by individual chapters on microscope components and items and techniques necessary for the proper use of the microscope. Included in these chapters are such subjects as objectives, eyepieces, substage condensers for transmitted light, refracting and reflecting condensers, illumination and illuminating devices, light filters and cells, measuring devices, and mounting mediums for specimens. There is also a chapter on photomicrography. In addition the book contains an adequate index, a glossary of terms used in microscopy, and an appendix which contains a few mathematical tables, a listing of microscopical societies, sources for purchasing microscopes and their parts as well as mounting mediums and specimens. The book is highly recommended for all persons who are interested in microscopes but especially for those who use them, supervise their use, or are responsible for their purchase.

Convulsive Disorders of Children. By Dora Hsi-Chih Chao, M.D., Physician and Assistant Director, Blue Bird Clinic, Methodist Hospital, Houston, Ralph Druckman, M.D., Neurologist, Blue Bird Clinic, and Peter Kellaway, A.M., Ph.D., Director, Blue Bird Clinic. Cloth. \$6. Pp. 151, with 25 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This book has been expanded from a manual which the authors originally prepared for the use of residents. It is a concise description of the problem of epilepsy in children from the clinical viewpoint. The first half of the book is taken up with practical classification and description of each of the various types of epilepsy, well documented with

illustrative case reports and electroencephalogram tracings. The second half discusses seizures of other types, due to other causes, which must be considered in the differential diagnosis of epilepsy. There are short chapters on convulsive "equivalent" seizures, benign febrile convulsions, breath-holding attacks, and extracerebral causes of convulsions. There is also a chapter dealing with epilepsy in adults. From a practical viewpoint the chapters on the investigation and diagnosis of a patient with seizures and on the management of seizures are most valuable. For those unfamiliar with EEG's, the chapter describing this technique and its interpretation in epilepsy is straightforward, simple, and understandable. The book ends with a table giving the indications, dosages, and toxic effects of the various drugs used. This is an excellent handbook on epilepsy for interns, residents, general practitioners, and pediatricians who are faced with the everyday problem of diagnosis and treatment of the patient with seizures. It is not intended to describe original or basic studies but does supply a short bibliography for the more sophisticated reader. It is well written, well documented, and soundly based clinically. The information given on drug therapy is up to date, sensible, and easy to find.

Ciba Foundation Symposium on the Cerebrospinal Fluid: Production, Circulation and Absorption. Editors for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., and Cecelia M. O'Connor, B.Sc. Cloth. \$9. Pp. 335, with 141 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6; J. & A. Churchill, Ltd., 104 Gloucester Place, Portman Sq., London, W. 1, England, 1958.

This book presents the contributions of an exceptionally productive and articulate group of investigators to the many anatomic, physiological, and biochemical problems relating to the fluid that fills the ventricular and subarachnoid systems of the brain and spinal cord. The first 10 papers deal with fundamental problems of development, secretion, and diffusion. These papers and the discussions that follow each reveal at once the ingenuity of modern techniques and the puzzling nature of the results. The following five chapters deal with many urgent practical problems, such as hydrocephalus and spinal anesthesia, and the last chapter is a general discussion. Careful editing of the discussions has made them coherent and interesting, in welcome contrast to the confusing presentations that have been published occasionally in the past. The index is another welcome feature, and there are many instructive illustrations. While a frank disclosure of an unsatisfactory state of knowledge of particular fields of science is desirable, this book encourages the reader to wish for something further. Might it not be good discipline for the participants if, after their critical appraisal of methods, they met in a workshop session and endeavored to formulate

statements of established results? A concluding chapter of this sort should win the gratitude of busy practitioners and harried medical students everywhere.

The Eye: A Clinical and Basic Science Book. By E. Howard Bedrossian, B.S., M.D., M.Sc. (Med.), Assistant Professor of Ophthalmology in Graduate School of Medicine of University of Pennsylvania, Philadelphia. With foreword by Edmund B. Spaeth, M.D. Cloth. \$11. Pp. 340, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St. W., Toronto 2B, Canada, 1958.

This new book is for the most part a condensation of useful information on clinical ophthalmology and on the basic sciences. It makes no claim to be a complete textbook and much of it is arranged in outline form. The portion dealing with the basic sciences of anatomy, pathology, physiology, biochemistry, and optics serves as an excellent survey of these fields for the ophthalmology resident, especially as a review in preparation for the Board examinations. The clinical portion is too abbreviated for it to be of value as a reference or a textbook for the undergraduate student, but its very terseness may be of some value for those seeking a rapid review of the field. The final chapter on ocular emergencies might be read with profit by every student and general physician. While there are many fine illustrations the book could be further improved by the use of additional photographs and diagrams. By an original method of presentation the author, although he has not produced another May or Gifford-Adler, has contributed a book with a limited but nevertheless important place in ophthalmologic literature.

Surgery of the Head and Neck. By Robert A. Wise, M.D., Associate Clinical Professor of Surgery, University of Oregon Medical School, Portland, and Harvey W. Baker, M.D., Clinical Instructor in Surgery, University of Oregon Medical School. Handbook of operative surgery. Cloth. \$9.75. Pp. 319, with 82 illustrations by Jessie W. Phillips. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1958.

This small but well-written volume adds notably to the series of handbooks of operative surgery. The line drawings by Jessie W. Phillips are clear and effectively complement the text. In addition to outlining the standard operative procedures on the head and neck, many worthwhile features of examination, preoperative and postoperative care, anesthesia, and operative complications peculiar to this anatomic region are presented. The radical approach to lesions of the head and neck depicted in this volume represents the only rational method of obtaining reasonable results in long-followed cases. The only criticisms concern the site of division of the prethyroid muscles in plate 57 and the placement of the vertical portion of the incision for neck dissection, in plate 71. The strap muscles of the

thyroid region should be divided at a higher level than shown in the plate, and the vertical portion of the neck dissection incision should be placed further posteriorly in order to avoid marginal necrosis over the carotid artery and its branches. This edition is recommended for all residents who wish to study operative techniques of the head and neck area and surgeons who treat diseases in this region.

The Clinical Examination of the Nervous System. By C. H. Monrad-Krohn, M.D., F.R.C.P. With assistance of Sigvald Refsum, M.D., Professor of Medicine (Neurology) in University of Oslo, Oslo, Norway. Eleventh edition. Cloth. \$9.50. Pp. 466, with 173 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16; H. K. Lewis & Co., Ltd., 136 Gower St., London, W. C. 1, England, 1958.

This book follows the pattern established in its first edition (1921) and maintains the same standards. It is written from the clinic for the clinic and is based largely on personal experience. Certain sections have been curtailed in the new printing and others expanded. The chapter on associated or synkinetic movements is expanded, the examination of aphasia enlarged to cover the method used in the author's hospital, and newer tests for myasthenia gravis added. Monrad-Krohn now having retired from the chair of neurology in the University of Oslo, the book has been revised with the assistance of his successor, Sigvald Refsum. As a result of full revision the present edition is virtually a new book. There are a few minor typographical errors, not of sufficient quantity to detract seriously from the value of this excellent book.

Clinical Epidemiology. By John R. Paul, M.D., ScD., Professor of Preventive Medicine, Yale University School of Medicine, New Haven, Conn. Scientist's Library, Biology and Medicine. Edited by Peter P. H. De Bruyn, M.D. Cloth. \$5. Pp. 291, with 37 illustrations. University of Chicago Press, 5750 Ellis Ave., Chicago 37. Cambridge University Press, Bentley House, 200 Euston Rd., London, N. W. 1, England; University of Toronto Press, Toronto 5, Canada, 1958.

The author, who is a well-known authority in the field of epidemiology, has made a fine contribution in presenting in a most succinct and concise manner a modern approach to his subject. This book should be considered a requisite not only for public health career personnel but also for every practicing physician. It conveys a most modern, practical definition of epidemiology that may be used effectively throughout the world. Of special interest is the chapter entitled, "The Environment: Microclimate," in which the "social climates" of various peoples and lands are discussed. Arriving at accurate conclusions by this approach requires great understanding and resourcefulness. Also, the author's description of the history of epidemiology and of proper epidemiologic philosophy gives greater understanding and impetus for further progress in this field.

QUESTIONS AND ANSWERS

SYSTEMIC REACTIONS TO FOREIGN SERUM

TO THE EDITOR:—Please give advice on the best procedures in the following problems: First, a patient has a soil-contaminated sealed wound and is therefore subject to tetanus antitoxin therapy. Immediately after being given a skin test with 1:10 to 1:10,000 dilution of horse and bovine serums, the patient shows a mild or severe systemic reaction or a huge skin reaction. Another patient with the same type of injury shows a mild skin test reaction (wheal, 0.5 cm.; erythema, 1 cm.). When the accepted method of desensitization is carried out, with dosage started as that dilution which fails to produce a skin reaction and increased by 50% at 20-minute intervals, the patient exhibits the symptoms of systemic reaction, namely, hives, wheeze, hypotension, and shock.

Second, a patient is bitten on the nose by a stray dog and thus requires hyperimmune rabies serum. Skin tests with 1:100 dilutions of horse and sheep serums both result in a huge immediate local reaction, each test having a negative control. Epinephrine, antihistamines, and steroids help to relieve the symptoms of the serum reactions, but, as far as is known, they cannot prevent them. As an alternative to serum therapy in these cases, should tetanus toxoid and rabies vaccine be used, in spite of the danger during the period it takes to develop immunity? On the other hand, should attempts at serum desensitization be continued, with 10^{-6} to 10^{-9} dilutions of serums used, even if it will take days to complete the series and the patient will thus be exposed to possible fatal consequence?

M.D., California.

ANSWER.—Neither a positive nor a negative skin test is an absolute index as to the type of systemic reaction which a patient may develop after administration of a foreign serum. An ophthalmic test is less sensitive but is considered to be more reliable for the determination of sensitivity. This is carried out by placing a drop of 1:10 solution of horse serum in the lower conjunctival sac. A positive reaction is indicated by itching, burning, redness, and lacrimation within 10 to 30 minutes. This reaction can be controlled by instillation of a drop or two of epinephrine solution, 1:1,000. In spite of the

apparent greater reliability of this test, deaths due to anaphylaxis after the administration of horse serum in which the conjunctival test was negative have also been reported. In view of the fact that neither the skin test nor the ophthalmic test is completely dependable, administration of immune serum must always be carried out with extreme caution, with certain criteria in mind: 1. It is most hazardous to administer serum to patients with a strongly positive findings in the conjunctival test. 2. It is less dangerous if a negative reaction to the ophthalmic test and a positive reaction to the skin test are present or if both tests yield doubtful results. 3. In instances such as in the first problem presented, when the patient shows a "huge skin reaction," two types of procedure may be followed. First, the intravenous administration of serum may be done. It has been found in many instances that intravenous administration has failed to produce constitutional symptoms. One method is to fill an infusion flask with 100 cc. of a 1:1,000 dilution of the immune serum in isotonic sodium chloride solution. About one hour is allowed for the introduction of this amount, which corresponds to 0.1 cc. of undiluted serum. After this, the patient is given 100 cc. of a 1:100 solution at the same rate. This corresponds to 1 cc. of undiluted serum. Then the undiluted serum is injected with a syringe into the rubber tube at intervals of 10 to 15 minutes, in accordance with this schedule: 0.2 cc., 0.4 cc., 0.8 cc., 3.2 cc., 6.4 cc., and 12.8 cc. Subsequently, the entire amount may be given. Second, in the markedly sensitive patients, another method is to administer 0.1 cc. of epinephrine mixed with each subcutaneous injection of serum. The serum should be given by deep subcutaneous injection once every 20 minutes. One should begin with 0.05 cc. of a 1:10 dilution, followed by 0.1 cc., 0.3 cc., and 0.7 cc. If that is tolerated, then the undiluted serum may be given in doses of 0.1 cc., 0.5 cc., and 0.7 cc. at 20-minute intervals. If untoward symptoms develop at any stage, the administration of serum should be stopped and 1 cc. of epinephrine should be injected intramuscularly. In instances of alarming reactions, it may be necessary to give 0.05 to 0.1 cc. of epinephrine solution intravenously. After the allergic manifestations have completely subsided, the injections of serum may be resumed, beginning with a dose equivalent to one-half or less of the previously tolerated dose. In regard to the "mild skin reaction," desensitization may be attempted either intravenously or in the following manner: The initial dose should be no greater than 0.1 cc. of a 1:100,000

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

dilution of the antitoxin administered subcutaneously. Increasing amounts, usually double the preceding dose, are given every 10 to 20 minutes, if no reactions occur, until the required amount has been administered. Under any circumstances, no serum should ever be administered unless a syringe with a 1:1,000 epinephrine solution is at hand.

In respect to the second problem, dealing with prophylaxis against rabies in a patient sensitive to horse and sheep serum, a rabies vaccine, the so-called dried killed virus vaccine, may be used. This vaccine is a suspension of embryonic duck tissue infected with fixed rabies virus prepared according to the Powell-Culbertson method. The treatment for the prevention of rabies in exposed subjects consists of daily subcutaneous injections of this vaccine for 14 days. Caution must be used in administering the vaccine to persons with a history of allergy, especially to egg.

ANSWER.—The use of antitoxin is too dangerous in the treatment of a patient exposed to tetanus. The reason for this is not the positive skin reaction but the systemic reactions elicited by small doses of serum (presumably of both horse and bovine serum). The use of tetanus toxoid suggested by the inquirer is important only for future protection, not for the present danger. The advice in this case is to administer large doses of antibiotics. The tetracycline types are recommended by some (A Textbook of Medicine, ed. 9, edited by Cecil and others, Philadelphia, W. B. Saunders Company, 1955). Penicillin, aureomycin, and terramycin were found experimentally to be effective against *Clostridium tetani*-infected mice (Taylor and Novak, *Antibiotics & Chemother.* 2:517, 1952). Whether débridement of the wound and exposing it to the air should likewise be done would depend on the nature and site of the second wound.

The second question, involving the bite of a stray dog, is less clearly stated. It is assumed that thorough search for the dog has been in vain. The inquirer speaks of a large skin reaction to horse and sheep serum. This is a warning for extreme caution in the use of such serum. It is not an absolute contraindication against its careful use in the presence of clear danger of rabies. Large skin reactions are not always precursors of systemic reactions. In a recent review, Habel (*Pediatrics* 19:923, 1957) advises that, if antirabies serum is used, a large dose (0.5 ml. per kilogram of body weight) should be given intramuscularly followed by injection of antirabies vaccine. In this case it seems advisable to inject subcutaneously into the distal anterior part of the thigh or, preferably, in the lower part of the forearm with a tourniquet in place ready to be tightened immediately if a systemic reaction begins. The dose of antiserum should be divided into small portions to be given at hourly intervals. At

the onset of a systemic reaction, the tourniquet is tightened to shut off circulation. Simultaneously, epinephrine is given into the opposite arm by an assistant. Release of the tourniquet for brief intervals every 20 minutes will permit slowing of the reaction, with epinephrine used around the site of the injection and, if necessary, above the tourniquet to control additional reactions. Of course, if a systemic reaction occurs no additional serum should be used. Antirabies vaccine injections (at least 14 doses) should be administered whether the antiserum is given or its administration is contraindicated because of a systemic reaction.

ABSORPTION OF EXTRAVASATED BLOOD

TO THE EDITOR:—A 54-year-old woman experienced generalized oozing from the operative site for two weeks after a hysterectomy. At autopsy, the patient was found to have had generalized jaundice, bile nephrosis, hemoperitoneum, and liver damage. During her hospital course, the patient received 12 pints of blood. Transfusion reaction due to isoimmunization does not appear to be a factor. Is the extravasated blood absorbed, and what is the effect on the icteric index?

M.D., Indiana.

ANSWER.—When large amounts of blood are extravasated into any body cavity, a certain amount of absorption does occur. There is evidence that blood is absorbed at not too slow a rate from the peritoneal cavity, and this has been proposed as a method of transfusion where veins are not accessible. As a certain amount of this blood is already destroyed prior to absorption and the hemoglobin molecule may well begin to break down before it passes the peritoneal barrier, there will be a rise in the icteric index to levels somewhat above normal. However, the absorbed red blood cells are probably already damaged and will be rapidly destroyed, also leading to hyperbilirubinemia insufficient, however, to produce clinically severe jaundice. It is of extreme importance to know how rapidly these 12 pints of blood were given and what effect this had on the oozing. The syndrome of bile nephrosis is not a well understood one and is usually seen only when there has been longstanding liver disease with obstructive jaundice. Hypoprothrombinemia and factor VII deficiency are frequent complications of liver disease. The extent of the deficiencies of prothrombin and factor VII are poorly correlated with the severity of the disease. However, severe hepatic failure usually presents the most severe prothrombin complex deficiencies. Minimal damage, as represented by findings in other liver function tests, may demonstrate rather severe prothrombin and factor VII deficiency. An associated factor that may be present in this case is a deficiency of prothrombin due to

an inability to absorb or utilize vitamin K. One would have to know the extent of the antibiotic therapy prior to surgery in this patient, and if such were present this might account for a considerable degree of hypoprothrombinemia.

Given such a case with extensive oozing, a complete coagulation profile and adequate history for prior evidence of hemorrhagic diathesis should be available. The blood studies should include platelet count and bleeding time, prothrombin time, one of the adequate coagulation time determinations, such as the three-tube Lee-White, and serum prothrombin time determination. These tests are generally sufficient to pick up any abnormality in the coagulation mechanism. Occasionally, one is forced to do thromboplastin generation studies or cross-matching tests with known coagulation deficiencies. However, the latter two tests require the presence of laboratory workers well versed in the disturbances of bleeding and coagulation. Many good references are available for this work (Biggs and MacFarlane, Human Blood Coagulation and Its Disorders, Springfield, Ill., Charles C Thomas, Publisher, 1957; Quick, Hemorrhagic Diseases, ed. 2, Philadelphia, Lea & Febiger, 1957; Tocantins, Coagulation of Blood, New York, Grune & Stratton, Inc., 1955). As far as the survival of transfused blood is concerned, it is generally accepted that blood properly stored for no longer than 21 days has a red blood cell survival of approximately 100 days (Ashby survival time studies). Certainly in any hemorrhagic diathesis one is generally safer in giving fresh blood (no older than 24 hours). The syndrome of fibrin depletion is usually associated with major thoracic surgery or one of the obstetric complications, such as dead fetus syndrome or premature separation of the placenta. Occasionally, patients with malignancy, such as carcinoma of the prostate and leukemia, have also shown fibrinolytic diathesis and hypofibrinogenemia. In general, in the evaluation of any hemorrhagic diathesis the most important approach is that of proper history for hemorrhagic disturbance, in the patient prior to the present incident and in the patient's family. The vast majority of such situations are hereditary disorders. The acquired situations are such that one must seriously consider previous liver disease, cirrhosis, hepatitis, postnecrotic cirrhosis, and similar conditions and the complication of superimposed idiopathic or symptomatic acquired thrombocytopenic purpura. Occasional platelet depletion may be accomplished by massive transfusion of the blood, where the transfused blood has a very low level of platelets and a dilution factor occurs after the pouring of the blood into the patient's circulation. However, this should rapidly disappear within 24 to 36 hours.

TREATMENT OF SCARLET TONGUE

TO THE EDITOR:—One patient in five who comes to this office manifests a scarlet tongue, without soreness. Gastrointestinal complaints are present, and some patients have systemic symptoms and findings. One woman in particular has a generalized dermatitis that resembles the color of the tongue. Histories reveal that these patients have taken broad-spectrum antibiotics, alcohol over a period of time, and large amounts of vitamin B or vitamin B complex; diabetes and other conditions have also been noted. The mostly likely diagnosis is moniliasis. What is the best treatment for generalized moniliasis? Amphotericin B has been recommended, but it has been noted that there are many side-effects and little improvement from the use of this agent. The incidence of this condition is increasing. Vitamins, calcium, nystatin, and several other agents have been used, to no avail.

M.D., Arkansas.

ANSWER.—There is no panacea for redness of the tongue and buccal mucosa. For monilial infection of the mouth, the most effective local remedy has been mouth washes, from four to six times a day, with nystatin vaginal tablet freshly dissolved in about 60 cc. of water. If Candida is present, there is a rapid response to this type of mouth wash within a few days. Patients in whom vitamin B complex has proved ineffective are sometimes benefited by large doses of vitamin A, particularly in the form of buccal tablets, 150,000 units each, dissolved in the mouth once daily, ostensibly to get the local effect of vitamin A on the buccal mucosa. From the description given, pellagra cannot be definitely eliminated as a possible cause.

ANSWER.—The causes of scarlet tongue are many and varied. Other than the many diseases associated with color changes on the tongue, such as scarlet fever, some of the anemias, and pellagra, food and drugs are often causative agents. The marked increase in the use of lipstick is also to be considered. It is fashionable today to use too much of vitamin B and its complexes. In this instance, a positive diagnosis of moniliasis should be confirmed. In these patients the suggested action would be to remove the cause if ascertainable. All medicaments should be withdrawn, and a high-protein, low-fat, low-carbohydrate diet should be given along with yogurt or lactobacilli preparations.

ANSWER.—It seems unlikely that these patients are suffering from generalized moniliasis. The clinical manifestations described have been observed in the absence of Candida and have been attributed to a temporary vitamin abnormality associated with the antibiotic-induced alteration in the bacterial flora of the intestinal tract. The findings usually disappear after the withdrawal of antibiotics.

though this may require some time. Generalized moniliasis usually affects severely debilitated patients who have been intensively treated with broad-spectrum antibiotics, adrenocortical steroids, or roentgen irradiation. In such instances, aspiration pneumonia or *Candida* septicemia may develop. Blood cultures should be obtained in an effort to demonstrate the typical creamy, yeast-like colonies which grow well on Sabouraud's medium. The treatment of choice for the generalized infection is parenterally given amphotericin B, which has been shown to be effective in clearing the blood stream of *Candida* organisms within a few days (Procknow and Loosli, A. M. A. *Arch. Int. Med.* 101:765, 1958). Recommended dosage is 0.5 to 1.0 mg. per kilogram of body weight per day, to be given intravenously over a period of six hours. The duration of therapy has not been clearly defined, but a significant clinical response has occurred after four to eight weeks of treatment. Side-effects such as chills, fever, headache, nausea, and vomiting are common but are not so severe as to contraindicate use of the drug. Local mucocutaneous infections involving the mouth, pharynx, and lower gastrointestinal tract are much more common. A history of prolonged treatment with broad-spectrum antibiotics frequently can be elicited from such patients. Nystatin has proved to be most efficacious in the treatment of local infection. If the oropharynx is involved, nystatin should be used in suspension as a gargle every three to four hours. When it is thought that the entire gastrointestinal tract is involved, tablets containing 500,000 units of nystatin should be given four times daily. This type of treatment is directed at local infection, since significant blood levels of this drug cannot be achieved with oral therapy.

CALCIUM REQUIREMENT FOR ADULTS

TO THE EDITOR:—*What is the minimum daily calcium requirement for adults? Various textbooks indicate that, while the growing child and pregnant woman need large amounts of calcium, the normal healthy man or woman does not need to worry about it. However, would adults on milk-free diets because of allergy obtain sufficient calcium in an otherwise balanced diet? If not, how much supplementary calcium should they be given?*

M.D., California.

ANSWER.—According to the "Recommended Daily Allowances," as set forth by the National Research Council's Food and Nutrition Board, an adult should ingest 800 mg. of calcium per day. This figure was arrived at by calcium balance studies, which admittedly have their limitations. Apparently, many adults have the ability to attain equilibrium at widely different levels of calcium intake. Until such a time as there is more definitive evidence available, it would probably be well for an adult to

aim at the level of 800 mg. of calcium per day. This can easily be obtained in the United States from dairy products. If milk is contraindicated, care should be taken to see that other sources of calcium, such as green, leafy vegetables, turnip greens, and broccoli, are included in the diet. It is recognized that the allowances of the Food and Nutrition Board are most certainly generous, and there are many who feel they are excessive.

The allowances for pregnancy and lactation are intended to provide for the growth of the fetus during the last trimester and for the production of milk. It should be emphasized that the recommended allowance for the last trimester of pregnancy presupposes that the woman was well nourished at the onset of pregnancy. Where there was previous undernutrition, the increase in calcium should be supplied earlier. The following table gives the recommended dietary allowances of calcium for adults and for pregnant and lactating women. If sufficient calcium cannot be obtained from the diet, it is, of course, necessary to give supplemental calcium.

Recommended Dietary Allowances of Calcium

	Age, Yr.	Calcium, Gm.
Men	25	0.8
Women	25	0.8
Pregnant (second half)		1.5
Lactating (850 ml. daily)		2.0

NONIRRITATING MATERIALS FOR PROSTHESIS

TO THE EDITOR:—*What malleable metals or plastics can be imbedded in human tissue without corroding or causing local irritation? Where can such materials be obtained?*

G. D. Gregory, M.D., Chicago Heights, Ill.

ANSWER.—Many surgical materials have been tested in the hope that one could be found which is not subject to corrosion and which produces no foreign body reaction. However, all have shown some foreign body reaction, and spectrographic analysis of the tissues which have been in contact with metals buried in the body usually shows the presence of an appreciable quantity of metallic ions in the tissues, indicating that some corrosion is going on. No metal or alloy has been absolutely resistant to corrosion when immersed in sea water. The same effect is exhibited by body fluids. There is, however, a great quantitative difference in the amount of corrosion and in the severity of the reaction to various metals and plastics. The 18-8-SMO stainless steels (type no. 316, 317), the non-ferrous alloys, such as cobalt-chromium-molybdenum, and titanium (pure metal) show the least corrosion and the least foreign body reaction of the metals commercially available (Jergesen, Studies of Various Factors Influencing Internal Fixation as a Method of Treatment of Fractures of the Long

Bones, report to the National Research Council, Committee on Veterans Medical Problems, contract V1011 M-1945). Plastic materials show no corrosion, but hip prostheses made of acrylic and nylon have produced such severe foreign body reactions that their use for this purpose has been abandoned. Oppenheimer and co-workers (*S. Forum* 4:672, 1953) showed that sarcomas can be produced in the experimental animal by implanted plastic materials. The conclusion seems inescapable that all prosthetic devices should be tested in the laboratory and in experimental animals before they are used in human beings. Efforts are being made to develop methods of testing and specifications for manufacture of devices to be used in the body. The legal as well as the medical implications have been pointed out (Report of the Joint Committee for the Study of Surgical Materials, *J. Bone & Joint Surg.* 36-A:411, 1954).

ETIOLOGY OF HOMOSEXUALITY

TO THE EDITOR:—*What early life experiences contribute to the formation of homosexuality? What is the future for boys who like to play at girls' games and wear girls' clothing and for girls who do the opposite? What definitive studies have been made toward clarifying this etiology?*

Edward Dengrove, M.D., Asbury Park, N. J.

ANSWER.—Homosexual development is contributed to by life experiences that interfere with normal masculine identifications on the part of the boy and feminine identifications by the girl. The boy who is possessively enveloped by a controlling mother may identify with the mother; the boy who is passively indulged by a weak father may tend toward effeminacy and homosexuality. The essential normal requirement for the boy is association with a healthy masculine father, or father representative, who, through identification, serves as the model for the boy's conception of himself. The same holds true with respect to the necessity for exposure to a normally feminine and motherly mother for the girl. Boys who play at girls' games and wear girls' clothes are involved in feminine identification arising from a too close and dependent relationship with the mother or betray anxiety about assumption of a masculine role. This latter attitude may be a result of intimidation by an overwhelming father. Girls who dress and play as boys consciously or unconsciously depreciate femininity, attributing greater values to the masculine role; this evaluation is usually derived from basic attitudes of the parents toward boys and girls. Many boys go through brief and transient periods of interest in feminine clothing during prepubertal years; if such behavior persists it may indicate neurotic or characterological disturbance in development that calls for therapeutic intervention. Many girls go through a temporary phase of tom-

boy interest and behavior, with normal subsequent development. Again, degree and persistence over a period of time may indicate more serious developmental disturbance. Classic studies have been made by Freud (Collected Papers, vol. 2, London, Hogarth Press, 1925, chap. 18 and 19), Fenichel (*Internat. J. Psycho-Analysis* 2:211), and Brown (*Am. J. Orthopsychiat.* 28:424, 1958).

RED BLOOD CELL COUNT

TO THE EDITOR:—*What is the most accurate, rapid method of doing a red blood cell count?*

N. W. Erickson, M.D., Beaver Dam, Wis.

ANSWER.—The most accurate method for determining the number of erythrocytes of the blood is the well-known standard method of direct counting in a hemocytometer under a microscope. Several instruments are now available, in which light is passed through a dilute suspension of erythrocytes. One such instrument is the Coulter counter, which gives a rapid and accurate erythrocyte count.

EXCESSIVE SALIVATION IN PARKINSONISM

TO THE EDITOR:—In THE JOURNAL, Sept. 6, 1958, page 138, it was asked whether anything can be used to check the excessive salivation which occurs in patients with paralysis agitans. The consultant indicated that there is no effective drug for this condition. I should like to call attention to the report by Dr. Kate Constable and myself (*J. A. M. A.* 163:1352-1357 [April 13] 1957); table 2 shows a 100% improvement of sialorrhea and drooling after the use of orphenadrine (Disipal), and the second case report describes a woman who refrained from making breakfast for her husband for fear the drooling of saliva might contaminate her husband's food but, after 3 tablets of orphenadrine a day, this problem was completely solved. I would recommend this drug to a physician who finds it difficult to control sialorrhea and drooling in such a patient. It is one of the safest drugs to use.

Lewis J. Doshay, M.D.
710 W. 168th St.
New York 32.

The above comment was referred to the consultant who answered the original question, and his reply follows.—ED.

TO THE EDITOR:—In the interests of truth, the action of orphenadrine in this connection should be made known. This consultant's experience with orphenadrine in patients with paralysis agitans in general but not with salivation has been disappointing. However, one of its beneficial side-reactions may have been overlooked in attempting to determine its over-all value.

THE JOURNAL

OF THE

American Medical Association

Published Under the Auspices of the Board of Trustees



VOL. 169, NO. 9

CHICAGO, ILLINOIS

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FEBRUARY 28, 1959

PROLIFERATIVE RETINOPATHY IN DIABETES MELLITUS

REVIEW OF EIGHT HUNDRED FORTY-SEVEN CASES

Howard F. Root, M.D., Stanley Mirsky, M.D.

and

Jörn Ditzel, M.D., Boston

PROLIFERATIVE retinopathy in the adult has become almost pathognomonic of diabetes. It is the most characteristic evidence of malignant or severe diabetes, in contrast to mild forms of the disease. The association of retinitis proliferans with diabetic nephropathy (intercapillary glomerulosclerosis, Wilson-Kimmelstiel syndrome) and with premature atherosclerosis and arteriolosclerosis in the younger patients with severe diabetes is further evidence which identifies retinitis proliferans as one of the specific products of insulin deficiency and of the other metabolic defects which, taken together, constitute the disease diabetes mellitus.

The striking concentration of proliferative retinopathy in diabetic patients with onset of diabetes early in life should stimulate and guide research. Knowledge of the site and mode of action of insulin, as well as of the interrelations of insulin action with that of other hormones and metabolic regulators, is incomplete. The fact that the action of insulin varies in different tissues may be illustrated by the well-known differences in its effects in muscle, liver, and brain tissues. The possible effects of insulin deficiency in ocular tissues, especially the retina and retinal vessels, are, as yet, incompletely studied.

Incidence and Distribution

Incidence.—Even though a few cases of proliferative retinopathy were described as occurring in diabetic patients during the preinsulin era¹ and

Clues to the relationship of proliferative retinopathy to diabetes were sought in the records of 44,249 patients with various forms of glycosuria. Data from the 847 cases of retinopathy so found showed that it most commonly developed in those diabetic persons with onset of disease early in life, but it was not a necessary consequence of diabetes in young patients. In those patients whose diabetes began before the 20th year, the average duration of diabetes before the discovery of proliferative retinopathy was 17.4 years, and none developed the condition in less than 8 years. It was usually the persons with onset of diabetes before 40 years of age, in whom insulin treatment and dietary management had been inadequate, who presented the characteristic neovascularization of the retina. There was also a definite association of proliferative retinopathy with diabetic nephropathy, and the latter was the predominant cause of death. Diabetic retinopathy is increasing in importance as a cause of blindness, and its prevention depends on early recognition and adequate treatment of the diabetes.

From the Joslin Clinic and the New England Deaconess Hospital.
Read, in part, before the International Diabetes Congress, Dusseldorf, Germany, July 22, 1958, and as the Herrera Lecture, Manila, Philippines, September, 1958.

an association between proliferative retinopathy and diabetes was firmly established by Klien,² Hanum,³ and Waite and Beetham,⁴ this degenerative condition first became a serious problem in the treatment of diabetes during the last decade. The

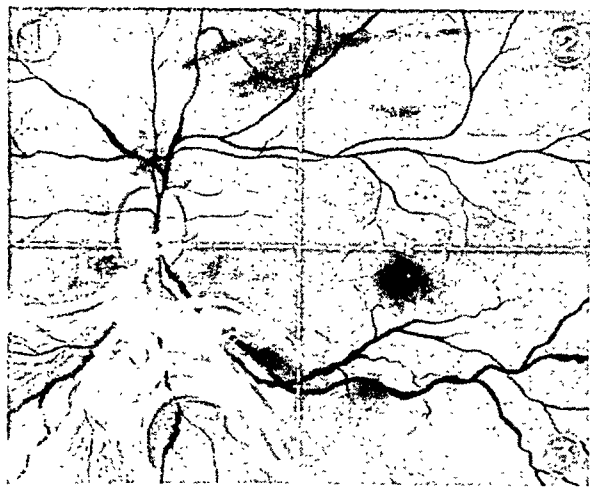


Fig. 1.—Drawing of proliferative retinopathy occurring in young patient with long-term diabetes: 1, few clusters of microaneurysms or punctate hemorrhages and slightly congested veins; 2, discrete exudates; 3, more severe venous varicosity; 4, proliferative fibrous tissue and new vessel formation.

changes in the retina of diabetic persons are intimately related to a degenerative process affecting the small blood vessels, particularly the capillaries and venules. Proliferative retinopathy is defined as the type of retinopathy characterized by ophthalmoscopically observable, newly formed vessels and connective tissue in or in front of the retina (fig. 1).

The incidence of proliferative retinopathy has steadily increased. Waite and Beetham⁴ found, prior to 1935, that, among 396 patients with diabetic retinopathy, 8% had proliferative retinopathy but that, in the years 1946 to 1956, among 2,103 patients with diabetic retinopathy 30% had proliferative retinopathy. Parallel to this increase in proliferative retinopathy is a substantial rise in blindness due to diabetes. In the United States, among 20,591 recipients of aid to the blind in 20 states 1.5% had diabetes. In Massachusetts, the highest rate of blindness due to diabetes was reported: 3.8%.⁵ However, in the same state for the year ending Dec. 1, 1957, 18% of new persons on the register had diabetes.⁶ Similar changes have been shown by other states.

Distribution of Proliferative Retinopathy.—Medical records in the Joslin Clinic from January, 1928, to Nov. 30, 1957, were screened (44,249 records, including patients with true diabetes and those with renal and nondiabetic glycosuria), and all cases of diabetic proliferative retinopathy, as established by a qualified ophthalmologist, were selected. The relationship of this lesion to the severity of diabetes

and, more important, to the quality of treatment was the outstanding feature in the distribution of the condition among diabetic patients. Thus, 3,732 juvenile diabetics, with onset of disease from infancy to the 15th birthday, were treated at the Joslin Clinic up to Aug. 1, 1955. Of these 3,732 patients, 1,072 (28.7%) had survived 20 or more years and 879 were alive in 1956. In table 1 is an analysis of vascular lesions observed in these 879 patients, as presented by White in 1956.⁷

Retinitis proliferans was present in 28.7% of 158 patients between 20 and 29 years of age; this incidence increased to 53.1% in 527 patients between 30 and 39 years and to 58.4% in 176 patients between 40 and 49 years. The association with simple retinitis appears in the figures for "all types" of retinitis. Thus, in patients between 40 and 49 years of age, 58.4% had retinitis proliferans and, in addition, 29.6% had simple retinitis. Analyses of these patients' records indicate that delayed diagnosis of diabetes, lack of diabetic control, and failure to follow dietary treatment had characterized the group, as well as such complications as severe ketoacidosis and infections.

That retinitis proliferans is not a necessary consequence of diabetes in the young patient is indicated by two sets of data. First may be quoted the statement of Joslin and co-workers⁸ that 34 patients with onset of diabetes between infancy and 15 years of age, out of 79 patients, have been winners of the Quarter Century Victory medal. The Quarter Century Victory medal is awarded to any diabetic patient who, after 25 years' duration of diabetes, is completely free from any retinitis or roentgenographic evidence of calcification in arteries and free from albuminuria and hypertension. Every one of these 79 patients had controlled his diabetes by testing the urine for sugar every day and altering his insulin dosage whenever necessary to control or prevent glycosuria. Second, data have been published from both the Joslin Clinic⁸ and the University of Iowa⁹ which indicate clearly that it is not merely the duration of diabetes but the quality and

TABLE 1.—Total Incidence of Vascular Lesions by Age at First Observation of Each Lesion

Age, Yr.	Albuminuria, %	Hypertension, %	Retinitis (All Types), %	Retinitis Proliferans, %	Calcified Arteries, %
10-19	4.2	1.8	4.8	0	6.5
20-29	18.5	16.7	63.2	28.7	45.5
30-39	24.7	46.3	81.4	53.1	83.3
40-49	37.0	51.9	88.0	58.4	95.0

* Including patients with even minimal traces of calcium (visible in films only with hand lens.)

degree of the control of diabetes which will prevent or postpone retinitis. Thus, in 189 patients at the Joslin Clinic, with diabetes of 20 to 29 years' duration in every case, ophthalmological study of the eyes with studies of the arteries was reported. No patient with onset of diabetes after 20 years of age

was included. In those patients whose control of diabetes had been good throughout the period, 45% were entirely free from retinal hemorrhages or any retinitis at the end of the period, whereas, among 116 patients with poor control throughout that same period, marked or extreme retinitis was present in 36%. Indeed, in the experience at Joslin Clinic, no patient with excellent or good control of diabetes, immediate use of insulin at the onset of diabetes, continuous and good medical supervision, and daily testing of the urine to prevent glycosuria and hyperglycemia has been seen to have proliferative retinopathy.

Material and Methods

Proliferative retinopathy was defined as any retinal neovascularization. Every patient in this series, totaling 847, had a complete examination and report by a competent, certified ophthalmologist. The following information was extracted from each record: sex, age at diagnosis of diabetes, age at diagnosis of proliferative retinopathy, duration of diabetes, and insulin dosage at the time of diagnosis of proliferative retinopathy. In especially large groups the incidence of complete loss of vision, family incidence of diabetes, control of diabetes, and hypertension were evaluated.

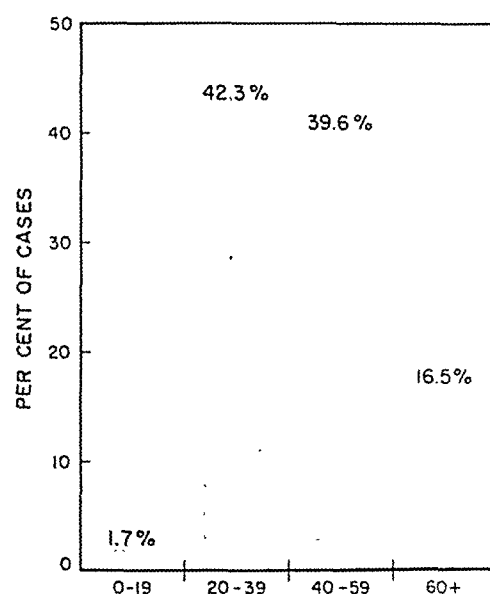
The relationship of proliferative retinopathy to diabetic nephropathy was elucidated. Presumptive evidence of nephropathy was the presence of persistent albuminuria, with a level of at least 50 mg. per 100 ml., when this was not obviously due to other causes; edema; and hypertension (defined as persistent elevation of systolic blood pressure over 150 mm. Hg and diastolic blood pressure over 90 to 100 mm. Hg, according to age). Whenever the diagnosis was in doubt further kidney function tests were employed, e. g., urea clearance, phenol-sulfonphthalein excretion, blood nonprotein nitrogen level, and urinary sediment. In addition, in a small group of patients with proliferative retinopathy, the capillary fragility, the vascular pattern of the conjunctival blood vessels, and paper electrophoretic fractionation of serum protein was determined; the results of these studies are reported elsewhere.¹⁰ During the 30 year-period, 331 of the 847 patients with proliferative retinopathy died. In this group the prognosis as to the duration of life after the diagnosis of proliferative retinopathy had been made was established. In each of the fatal cases the causes of death were determined from death certificates or postmortem examinations.

Results

Incidence.—A total of 847 cases of proliferative retinopathy were recognized during the 30-year period up to Nov. 1, 1957. This number undoubtedly is an underestimation of the real incidence, because only a small portion of patients with long-

term diabetes were regularly examined by an ophthalmologist. By examination of more than 400 diabetic persons with onset of disease before 45 years of age and duration varying from 10 to 25 years, we have found that for every patient with proliferative retinopathy approximately five had simple diabetic retinopathy. Many of these presumably have since developed neovascularization. This series included 379 males and 468 females, a sex distribution not far different from that for diabetic patients in general.⁶

Age at Time of Diagnosis.—Figure 2 presents the distribution of age at diagnosis of proliferative retinopathy. In more than 80% of patients, proliferative retinopathy was diagnosed before the age of 60. Proliferative retinopathy was found in only 14 (1.7%) of the diabetic patients under 20 years



	MALE	5	187	147	40	TOTAL
	FEMALE	9	171	188	100	468

Fig. 2.—Age at diagnosis of proliferative retinopathy in 847 diabetic patients.

of age. Thus, proliferative retinopathy is a condition predominantly recognized in young and middle-aged persons.

In figure 3 the distribution of age at diagnosis of diabetes in the 847 patients with proliferative retinopathy is presented. Of these patients, 351, or nearly 42% of the entire series, developed diabetes before the age of 20 years. This finding is in sharp contrast to the fact that only 13% of all diabetic persons have the onset of disease during these first two decades.⁶ Diabetes was present before the age of 40 years in 68% of those with retinopathy; whereas in only 12 (1.4%) did diabetes, presumably beginning after the age of 60 years, lead to proliferative retinopathy.

Thus, proliferative retinopathy predominantly developed in the diabetic persons with onset of disease early in life. Proliferative retinopathy is extremely rare or may be nonexistent in patients with onset of diabetes after the age of 60, as our

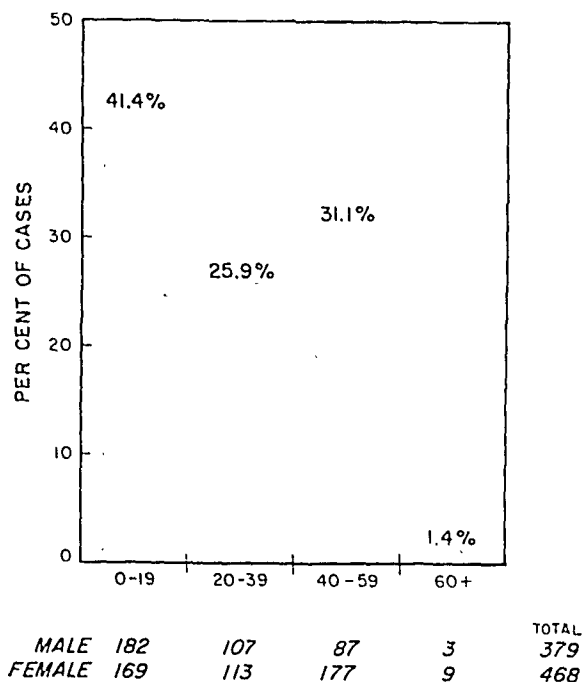


Fig. 3.—Age at diagnosis of diabetes in 847 patients with proliferative retinopathy.

12 patients all had indefinite time of onset recorded. Thus, in these 12 patients, no urine or blood sugar tests had been performed for years before the discovery of glycosuria. Probably, onset of diabetes occurred long before the age of 60 years.

Duration of Diabetes.—In table 2 the average duration of diabetes before the recognition of proliferative retinopathy is given. Long duration of diabetes was a striking feature in the great majority of the patients. Thus, in those patients whose diabetes began before the 20th year, the average duration of diabetes before the discovery of proliferative

TABLE 2.—Average Duration of Diabetes at Time of Diagnosis of Proliferative Retinopathy in 325 Patients

Age at Diagnosis of Diabetes, Yr.	Avg. Duration of Diabetes, Yr.	Variation in Duration, Yr.
0-19	17.4±4.2	8-28
20-39	17.8±6.6	3-29
40-59	10.2±6.2	1-28
60+	4.3±3.2	1-10

retinopathy was 17.4 years and none developed the condition in less than 8 years. For patients with diabetes beginning between the 20th and 40th year, the average duration of diabetes was 17.8 years. In six patients diabetes had been known for only three to six years, and these patients were all 38 or 39

years of age when the discovery was made. In patients over 50 years of age, a different picture was presented: a duration of less than eight years of diabetes was present in approximately one-half of the patients when proliferative retinopathy was found. However, in this older age group the difficulty of ascertaining the exact time of onset of diabetes has to be recognized.

Insulin Dosage.—In figure 4 the distribution of insulin requirement in patients with proliferative retinopathy is presented. The majority of patients required more than 25 international units daily, and most of these had onset of diabetes before the 45th year. It should be recognized that measurements of severity of diabetes dependent on insulin dosage are notably unreliable. Many temporary

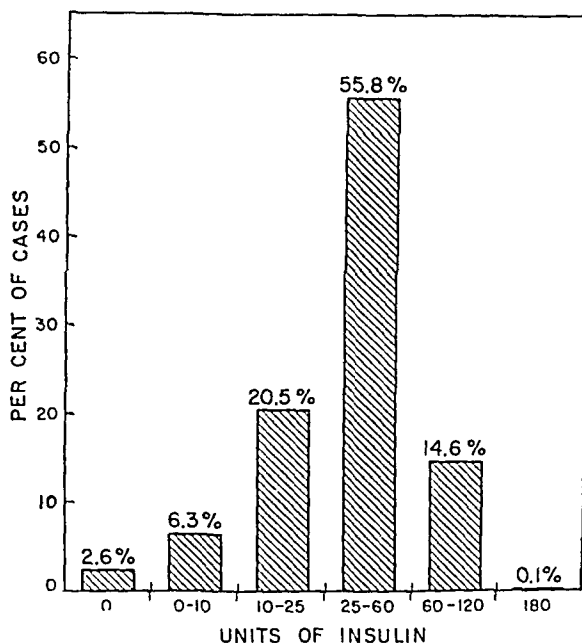


Fig. 4.—Insulin dosage (international units) in 847 diabetic patients with proliferative retinopathy.

factors, including improper diet, lack of physical exercise, infection, allergy, and renal status, would greatly modify the insulin requirement. Variations in dosage among our patients during their hospital stay often illustrated the decreasing insulin dosage with advancing renal failure and strict dietary rules. Many of the 249 patients who received from 0 to 25 units of insulin per day had formerly required a much higher dosage. In only 22 (2.6%) patients who had not received insulin did proliferative retinopathy develop, an illustration of delayed treatment.

Family Incidence of Diabetes.—The incidence of diabetes in the near relatives (grandparents, parents, uncles, aunts, and children) of 225 consecutive patients with proliferative retinopathy was found

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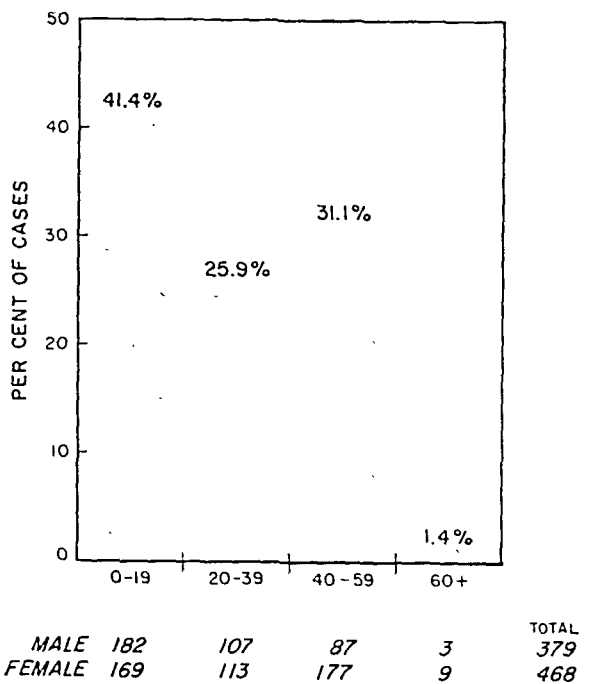


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Age at Diagnosis of Diabetes, Yr.	Av. Duration of Diabetes, Yr.	Variation in Duration, Yr.
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20-39	17.8±6.6	3-29
40-59	10.2±6.2	1-28
60+	4.3±3.2	1-10

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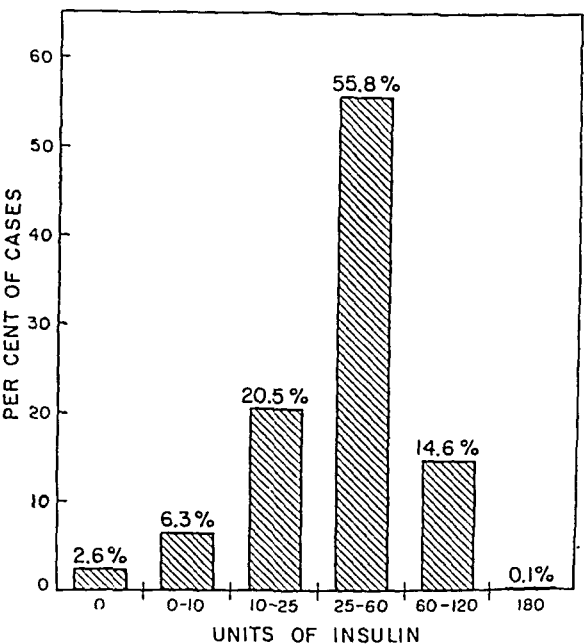


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Family Incidence of Diabetes.—The incidence of diabetes in the near relatives (grandparents, parents, uncles, aunts, and children) of 225 consecutive patients with proliferative retinopathy was found

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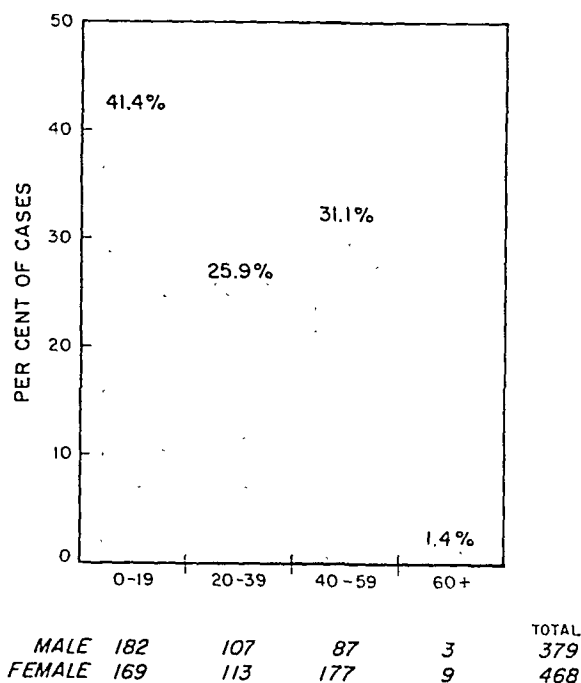


Fig. 3.—Age at diagnosis of diabetes in 847 patients with proliferative retinopathy.

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60+	4.3±3.2	1-10

retinopathy was 17.4 years and none developed the condition in less than 8 years. For patients with diabetes beginning between the 20th and 40th year, the average duration of diabetes was 17.8 years. In six patients diabetes had been known for only three to six years, and these patients were all 38 or 39

years of age when the discovery was made. In patients over 50 years of age, a different picture was presented: a duration of less than eight years of diabetes was present in approximately one-half of the patients when proliferative retinopathy was found. However, in this older age group the difficulty of ascertaining the exact time of onset of diabetes has to be recognized.

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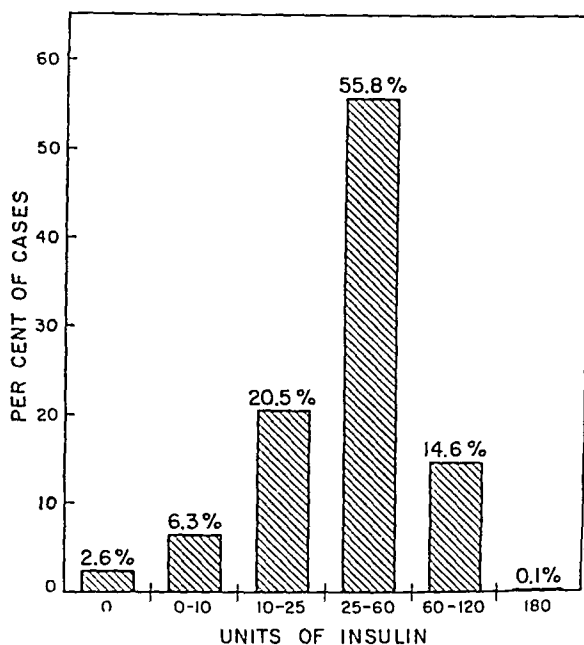


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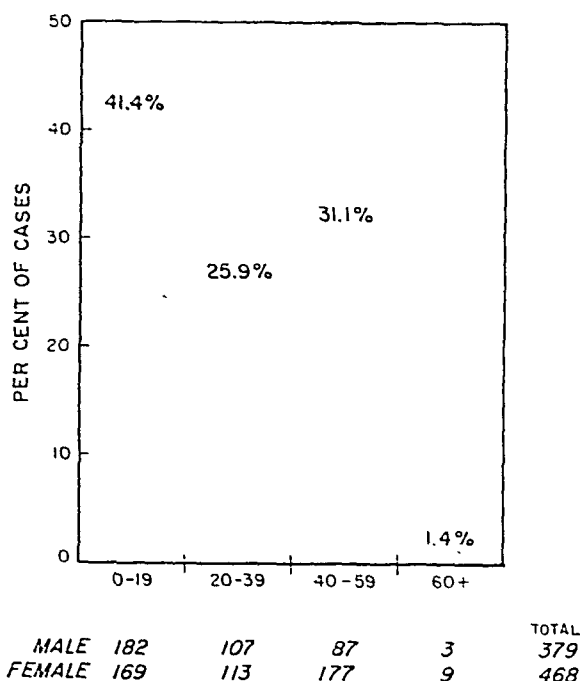


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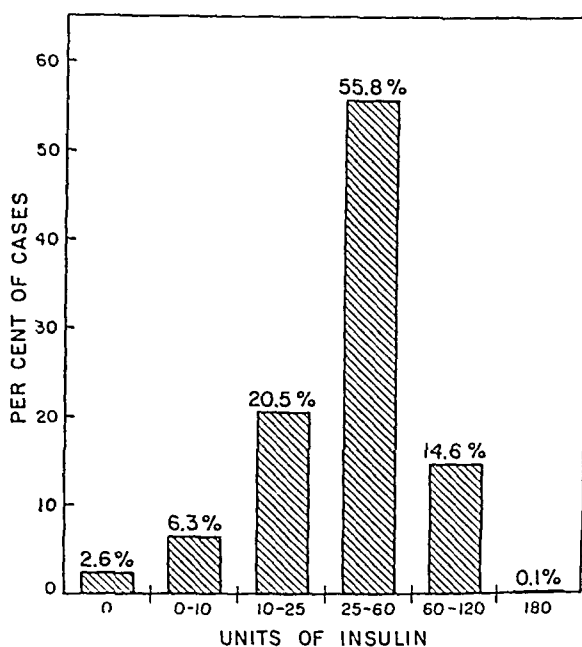


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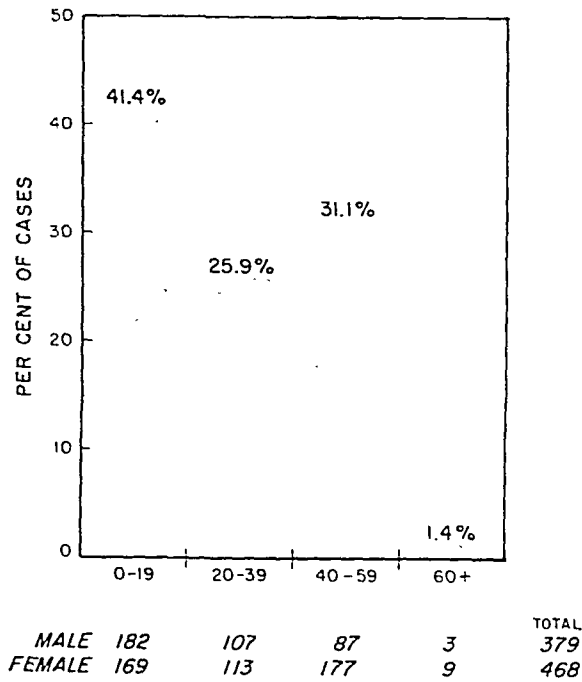


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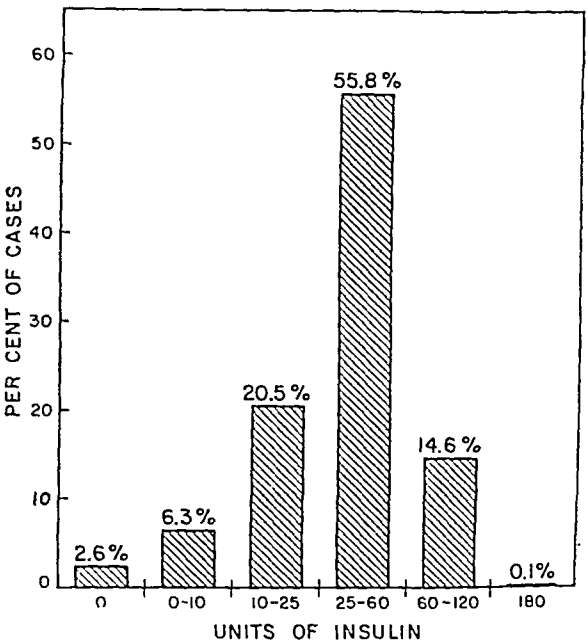


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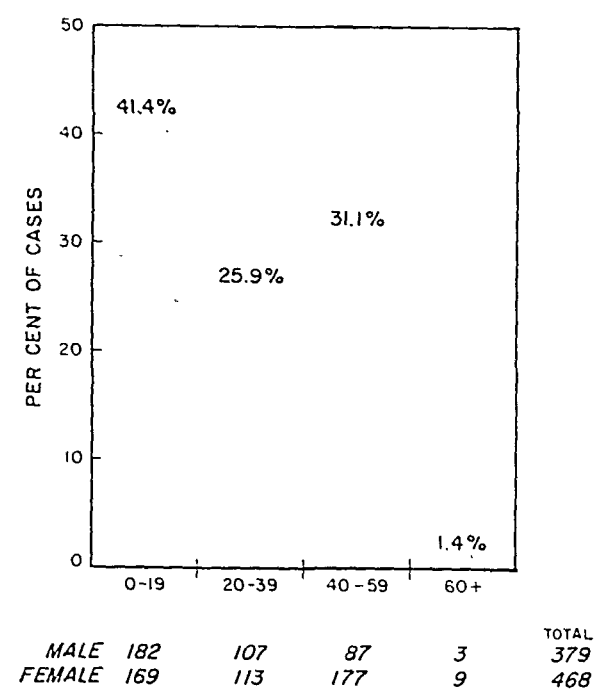


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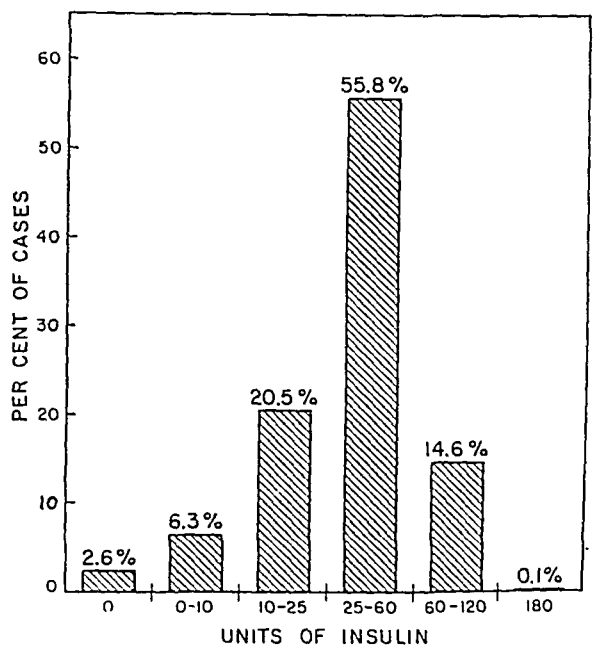


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The hereditary background was quite similar in patients with or without proliferative retinopathy. However, the type of diabetes, in terms of the degree of severity, differed in patients with proliferative retinopathy in that their diabetes generally was labile, required relatively large doses of insulin, and was difficult to control. This relationship between the incidence of proliferative retinopathy and the juvenile type of diabetes provides evidence that the metabolic disturbance consequent on an insulin deficiency constitutes a major factor in the production of the retinal lesions. Further support for this contention is afforded by the recent reports⁶ of retinopathy in patients with diabetes of hemochromatosis, of retinopathy and classic diabetic glomerulosclerosis in those with gross pancreatic fibrosis, and of retinopathy in the diabetic patients after pancreatectomy and relapsing pancreatitis.

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Proliferative retinopathy developed often insidiously in the absence of an initial intravitreal hemorrhage and, thus, appeared to be formed by a primary new vessel proliferation. However, some cases of proliferative retinopathy may be ushered in as a profuse retinal hemorrhage perforating the internal limiting membrane. (Because neovascularization was occasionally observed in retinas showing but a few microaneurysms, it is incorrect in all cases to regard proliferative retinopathy as an advanced stage of simple retinopathy.) In agreement with others,¹¹ it has been our experience that venous alterations are prominent features in cases of diabetic retinopathy progressing to proliferative retinopathy. Venous congestion and stasis was often an outstanding finding in these patients, and, occasionally, the retinal alterations suggested a typical occlusion of one of the main venous branches. The pathogenesis of proliferative retinopathy may well be explained by the association with marked, prolonged venous stasis.

Even though the exact nature of the stimulus which governs the growth of newly formed blood vessels in the retina is not known, recent clinical and experimental studies¹² of retrolental fibroplasia (retinopathy of prematurity) have increased our knowledge as to this process. The retina has the highest rate of metabolism of any body tissue and demands an excellent blood supply.¹³ Neovascularization takes place from the venules in an apparent response to factors associated with relative retinal anoxia. Ashton¹⁴ found in pathological specimens of diabetic proliferative retinopathy that the neovascularizations were always associated with underlying areas of obliterated capillaries or obstructed veins. It is now believed that proliferative retinopathy primarily formed by an organizing intravitreal hemorrhage is relatively rare in patients with diabetes.¹¹ Each recurrent hemorrhage with scarring causes further retinal deterioration.

Because of the potential importance of the venous changes in the development of diabetic retinopathy, Ditzel and co-workers¹⁵ recently studied the small vessels at a microscopic level in the bulbar conjunctiva. They found that venular dilation as part of a vascular response occurred frequently in young diabetics, to a lesser degree in middle-aged patients, and rarely in old diabetics, and therefore it shows a similar distribution in age as do both the retinal venous changes and the proliferative retinopathy. The venular dilation was often reversible, present for periods from the early onset of diabetes, and fluctuating with some relationship to the degree of diabetic metabolic disturbance.¹⁶ The venular response, leading to stasis and slight exudation, was correlated with the presence and severity of retinopathy, indicating that reversible changes, particularly in the veins, play an important role in the development of the diabetic retinopathy.

When proliferative retinopathy has occurred, every effort should be made to control diabetes, to use insulin skillfully, and to maintain good nutrition. The effect of hypophysectomy has so far not been beneficial in our few patients with proliferative retinopathy in whom it has been employed. Our experience with proliferative retinopathy lends further support to the growing conviction that the sequelae of long-term diabetes are related to the degree of control maintained over the years. Therefore, the physician is obligated to plan treatment and to supervise management in such a way as to provide the best control attainable at the present time of hyperglycemia, glycosuria, and other abnormalities.

Summary and Conclusions

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In an analysis of 847 consecutive cases of proliferative retinopathy among diabetic patients at the Joslin Clinic, no patient was found with this condition who had had good control of diabetes

with adequate diet and insulin therapy from the onset of the diabetes. The age at the onset of diabetes proved of greatest significance, in that diabetes developing early in life is severe, whereas diabetes developing late in life is, in general, mild.

Early diagnosis of diabetes and continuous control of diabetes may be of maximum importance in postponing and preventing proliferative retinitis, since many patients are now known to have survived diabetes with onset in childhood for periods of 20 to 30 years without any evidence of retinal hemorrhages when diabetic treatment has been adequate. The average duration of diabetes in this group at the time retinitis proliferans was recognized was 17.6 years, although it was impossible to correct the errors which are due to late or delayed diagnosis. The influence of sex and heredity appeared no different in diabetic patients with proliferative retinopathy than in those without.

The association of proliferative retinopathy and malignant diabetic nephropathy, or glomerulosclerosis of diabetes, is more intimate. Hypertension and albuminuria, although frequently absent at the onset, almost invariably appeared within months or years after the retinopathy. Causes of death were predominantly due to the diabetic nephropathy. Uremia was present in more than 50% of the patients. In the older group, although chronic glomerulosclerosis had been present, the terminal event was in many instances coronary occlusion.

The association of retinitis proliferans (proliferative retinopathy) with diabetic nephropathy and premature atherosclerosis in the young patient with severe diabetes further identifies this condition as one of the specific products of insulin deficiency and of the other metabolic defects which constitute the disease diabetes mellitus. The postponement or prevention of proliferative retinopathy is possible by intensified efforts to find diabetes early and to provide for its continuous adequate treatment by skillful use of insulin and of dietary measures.

15 Joslin Rd. (15) (Dr. Root).

Drs. W. P. Beetham, J. Herbert Waite, Alfred Scott, John Hill, and Henry Mosher provided reports of ophthalmological examinations.

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THE FAMILY OF THE HANDICAPPED CHILD.—Handicapped children belong to emotionally healthy and mature parents and to neurotic and insecure parents. In other words, the typical parent of a handicapped child is, like most of us, a person who can take just so much and no more. There are many ways in which parents of handicapped children say "This is too much." Social workers and nurses have heard them all again and again. Let us hope that the ears of doctors, nurses, and social workers will be tuned to hear the true meaning of what is being said, and that their professional services will be broad enough and flexible enough to meet the needs. For if the families of handicapped children can be salvaged the children can probably be salvaged too.—E. S. Reid, *Helping Parents of Handicapped Children*, *Children*, January-February, 1958.

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When proliferative retinopathy has occurred, every effort should be made to control diabetes, to use insulin skillfully, and to maintain good nutrition. The effect of hypophysectomy has so far not been beneficial in our few patients with proliferative retinopathy in whom it has been employed. Our experience with proliferative retinopathy lends further support to the growing conviction that the sequelae of long-term diabetes are related to the degree of control maintained over the years. Therefore, the physician is obligated to plan treatment and to supervise management in such a way as to provide the best control attainable at the present time of hyperglycemia, glycosuria, and other abnormalities.

Summary and Conclusions

In an analysis of 847 consecutive cases of proliferative retinopathy among diabetic patients at the Joslin Clinic, no patient was found with this condition who had had good control of diabetes

Method

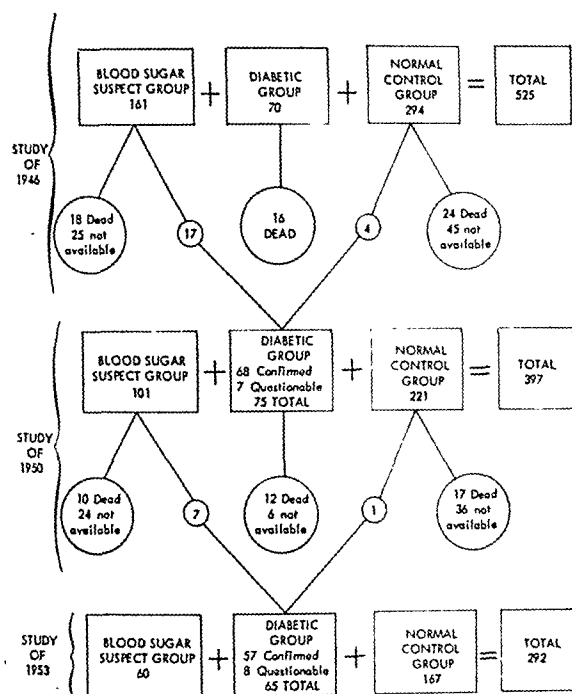
The study in 1953 was broadened to include a history; physical examination; ophthalmological examination; retinal photographs; x-ray studies of the chest, pelvis, and extremities; and a 12-lead electrocardiogram. The laboratory work consisted of routine postprandial blood sugar determinations and glucose tolerance tests, when indicated; urine sugar and albumin tests; and determinations of blood serum cholesterol and lipid values. Periodic follow-up examinations have been made throughout the length of the study.

Preliminary Background.—The purpose of the comprehensive examinations in this study was to compare abnormalities in the diabetic and nondia-

Hereditary: Of the diabetic group, 43.1% reported one or more relatives with diabetes in the immediate family (parents, siblings, or children), and an additional 19.4% reported other blood relatives with diabetes (grandparents, aunts and uncles, or other). The 62.5% positive history in the diabetic group

TABLE 1.—Age and Sex Distribution of Individuals Studied, by Classification, 1953

Age, Yr.	Diabetics				Nondiabetics			
	Male, No.	Female, No.	Total	%	Male, No.	Female, No.	Total	%
<25	0	1	1	1.4	7	20	27	11.5
25-34	1	3	4	5.6	10	16	26	11.0
35-44	3	2	5	6.9	25	21	46	19.6
45-54	5	9	14	19.4	30	23	53	22.6
55-64	19	10	29	40.3	23	22	45	19.1
>65	10	9	19	26.4	23	15	38	16.2
Total	38	34	72	100.0	118	117	235	100.0



Transition of original Oxford study groups. Total of 292 does not include 15 diabetic persons referred to this present study from other sources.

beti groups and also to establish a base line from which later studies on the same groups may be evaluated. As a preliminary background to the pathological results, a tabular summary of age, sex, heredity, and weight data is presented.

Age and Sex: Of the 72 diabetic persons who met our criteria in 1953, 38 are males and 34 are females. They are an older group than the 235 nondiabetic persons; 26.4% are 65 years and over, as compared with 16.2% of the nondiabetic group; 59.7% are in the age group 45-64, as compared with 41.7% of the nondiabetic group (table 1). The age factor has been considered in the pathological findings studied for the two groups.

compares with 21.7% in the nondiabetic group (14.0% in the immediate family and an additional 7.7% with other blood relatives) (table 2).

Overweight: On the basis of weight in 1953, the percentage of overweight diabetic males is about the same as in nondiabetic males: 34.3% compared with 32.5%. The percentage of overweight diabetic females is greater (46.6%) than nondiabetic females (34.5%). The difference is marked only for those aged 45 to 54 years.

On the basis of weight prior to 1953, 70% of diabetic males gave a history of previous overweight as compared with 47.9% of nondiabetic males. The percentage is greater for every age group 45 years and over. There was a history of overweight in 80% of diabetic females as compared with 52% in nondiabetic females. The differences, in general, hold for each age group.⁴

Pathological Differences Between Groups.—Through detailed physical and laboratory examinations it was hoped that pathological differences between the diabetic and nondiabetic groups could be discerned and defined. The results obtained from examinations of the skin, eyes, heart, and blood vessels are presented.

TABLE 2.—Family History of Diabetes, by Classification, 1953

History of Diabetes	Diabetics		Nondiabetics	
	No.	%	No.	%
No family history	27	37.5	184	78.3
Family history	45	62.5	51	21.7
Immediate family	31	43.1	33	14.0
Other relatives than immediate family	14	19.4	18	7.7
Total	72	100.0	235	100.0

Skin: Skin abnormalities and infections were not significantly different between the two groups, confirming clinical observations.

Eyes: Sixty-five (90%) of the diabetic persons and 201 (86%) of the nondiabetic persons had comprehensive ophthalmological examinations which included detection of retinal lesions, i. e.,

DIABETES IN A NEW ENGLAND TOWN

III. A COMPREHENSIVE BASELINE STUDY IN OXFORD, MASS.

Hugh L. C. Wilkerson, M.D., Leo P. Krall, M.D.

and

Frank K. Butler, M.S., Boston

In 1946, a survey to determine the prevalence of diabetes mellitus in an American community was conducted in Oxford, Mass.¹ The survey findings indicated a diabetes prevalence of 1.7% and suggested the estimate of one million known and one million unknown cases of diabetes in the United States. This estimate of diabetes prevalence has since become the basis for nationwide detection programs.² A follow-up study, in 1950,³ confirmed the previous findings and added the information that persons with "a little sugar in the urine" or blood sugar levels "a little higher than normal" developed diabetes eight times oftener than those with normal blood sugar levels (14.4% as compared to 1.8%). The 1950 investigations further indicated that a more comprehensive follow-up study was necessary to bridge the gaps in available knowledge of detection, diagnosis, onset, and progress of complications of the disease. Therefore, in 1953, the present study was undertaken to establish a base line for long-term epidemiologic studies.

Study Groups

Three groups of persons from the original 1946 Oxford Study¹ were selected for long-term follow-up according to the following criteria:

Diabetic Group.—Persons were diagnosed as having diabetes who repeatedly had one-to-two-hour postprandial venous blood sugar levels of more than 169 mg. of sugar per 100 ml. of blood, as determined by the Folin-Wu method, with glycosuria, or capillary blood sugar levels in excess of 199 mg. per 100 ml., as determined by the Folin-Malmros method, with glycosuria. Also included in this group were persons who had been previously given, by their physicians, a diagnosis of the disease.

Blood Sugar Suspect Group.—Persons were classified as blood sugar suspects who had one-to-two-hour postprandial venous blood sugar levels between 140 mg. per 100 ml. and 169 mg. per 100 ml. (Folin-Wu method) or capillary values between 170 and 199 mg. per 100 ml. (Folin-Malmros method), with or without glycosuria.

Normal Control Group.—A normal control group was selected from those persons with one-to-two-hour postprandial venous blood sugar levels less

A group of 525 people, originally studied with reference to diabetes in 1946, were restudied in 1950 and 1953. In the original group there were 294 classified as normal, 70 as diabetic, and 161 as suspect because of postprandial hyperglycemia. In 1953, 292 subjects remained available for study, and it was possible to draw certain conclusions as to the characteristics of diabetic and pre-diabetic patients. Persons classified as suspect were eight times as likely as the normals to appear later in the diabetic group. Abnormalities of the eyes, heart, and great vessels were found much more frequently in the diabetic than in the other two groups. The predictive value of comprehensive physical examinations was evident, and it appeared likely that further studies of this sort may yield hints as to prophylaxis against diabetes and its complications.

than 140 mg. per 100 ml. or capillary blood sugar levels less than 170 mg. per 100 ml., without glycosuria. The group was randomly selected from age and sex strata similar to those of the blood sugar suspects.

The figure shows the transition of these three groups from 1946 to the present study of 1953 and shows what happened to the original 525 persons selected and classified in the 1946 study. In addition to the 292 persons indicated for 1953 in the figure, 15 persons from the general population of Oxford were included. They were persons who had been given a diagnosis of diabetes by their private physicians and who were referred to our epidemiologic study in the interim period between 1950 and 1953. The diagnoses were confirmed by our laboratory.

For the purpose of this base-line study, the blood sugar suspect group and normal control group of 1953 were combined and designated as "nondiabetic." The total of 307 persons available for study, therefore, comprised 72 diabetic and 235 nondiabetic individuals. Eight persons with questionable diabetes were conservatively classified in the non-diabetic group.

From the Diabetes Field Research Unit, Chronic Disease Program, Division of Special Health Services, Bureau of State Services, Public Health Service, U. S. Department of Health, Education, and Welfare. Dr. Krall is now with the Joslin Clinic.

punctate and flame hemorrhages, cotton-wool and yellowish exudates and retinitis proliferans, vascular sclerosis of retinal vessels, and cataracts and blindness. Table 3, which summarizes the findings for both groups, shows a significant difference (at the level $p=0.99$) in retinal lesions between the diabetic and nondiabetic person. It is observed that the abnormalities are not associated necessarily with old age but occur with distressing frequency

two groups in regard to the abnormalities of tortuous great vessels are questionable, while elongation of the aortic knob and widened aorta are more pronounced among the diabetics in the 25-44 and 45-64 year age groups.

X-ray of the Chest, Pelvic, and Leg Vessels.—Calcifications of the vessels of the chest, pelvis, and legs were not uncommon in both groups (table 5). They were, however, more marked among the dia-

TABLE 3.—Findings of Eye Examinations, by Age, Type, and Classification, 1953

Age, Yr.	Diabetics, Nondiabetics,		Retinal Lesions, %*		Vascular Sclerosis of Retinal Vessels, %		Cataracts, %	
	No.	No.	Diabetics	Nondiabetics	Diabetics	Nondiabetics	Diabetics	Nondiabetics
25-44	6	70	16.7	0	0	0	0	0
45-64	41	96	24.4	1.0	73.2	66.7	12.2	6.3
>65	18	35	16.7	5.7	100.0	91.4	72.2	34.3
Total	65	201	21.5	1.5	73.8	47.8	27.7	9.0
>45	59	131	22.0	2.3	81.3	73.3	30.5	13.7

* Includes punctate and flame hemorrhages, yellowish and cotton-wool exudates, and retinitis proliferans.

in the younger (25-44 years) and the middle-aged (45-64 years) diabetic individuals. Three blind diabetic persons were found in the 45-64 year age group, while there were no blind persons in the nondiabetic group. The evidence found under this category becomes increasingly significant when it is observed that these abnormalities are almost non-existent among the nondiabetics.

Vascular sclerosis of the retinal vessels occurs with marked frequency in both the diabetic and the nondiabetic. The data indicate, however, that this abnormality may be associated with age, since the 81% and 73% of the diabetics and nondiabetics, respectively, thus afflicted are aged 45 years and over.

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The site of calcification occurred almost equally in the chest, pelvis, and leg vessels in the diabetics. Increased vascular damage in the diabetics is further demonstrated by the fact that three had suffered limb amputations and one had had bilateral mid thigh amputations.

TABLE 4.—X-ray Findings of the Heart and Great Vessels by Age, Type, and Classification, 1953

Age, Yr.	Diabetics, Nondiabetics,		Left Ventricular Hypertrophy, %		Tortuous Great Vessels, %		Other Great Vessels, %*	
	No.	No.	Diabetics	Nondiabetics	Diabetics	Nondiabetics	Diabetics	Nondiabetics
25-44	8	68	12.5	0	0	0	12.5	1.5
45-64	38	96	23.7	6.3	7.9	2.1	55.3	29.2
>65	14	32	35.7	25.0	7.1	15.6	78.6	63.6
Total	60	196	25.0	7.1	6.7	3.6	55.0	25.5
>45	52	128	26.9	10.9	7.7	5.5	61.5	38.3

* Aortic knob elongated, aorta widened and elongated.

Cataracts, in our series, are found to exist more frequently in diabetics, irrespective of age. This is a finding known to have been questioned as a result of analyses made by Waite and Beetham⁵ in 1935.

X-ray of the Heart and Great Vessels.—The abnormality of left ventricular hypertrophy appeared to be more frequent among the diabetics x-rayed than among the nondiabetics. Of the diabetics aged 45 and over, 26.9% showed some irregularities while only 10.9% of the nondiabetics in this age group had similar defects (table 4). Differences between the

Other Characteristics of the Diabetic Group.—Other characteristics of the diabetic patients also were studied.

Medical Visits: Approximately 21% of the diabetics who had had the disease for more than one year had not seen a physician within a year. Thirty-three per cent had made one or two visits, while 28% had been under close supervision with six medical visits or more yearly. The percentage of nondiabetics who had not seen their physician was 38.3, considerably greater than that of the diabetics. While many of the diabetics are apparently not

frequently examined, the number of their medical visits is still greater than that of nondiabetics in the community.

Insulin Administration and Urine Testing: Thirty-eight of the 72 diabetics (53%) were taking from 10 to 70 units of insulin daily while 34 (47%) were taking no insulin at all. The persistently elevated blood sugar levels of the latter group would seem to indicate that these individuals should be considered for a more restricted dietary regimen or the addition of some kind of insulin schedule.

Forty-eight per cent of the diabetic group checked their urines regularly, 12% tested it infrequently, and the remainder not at all.

Birth Weights and Pregnancies: Of 23 diabetic females over age 40, 47.8% gave a history of one pregnancy or more resulting in a baby with birth weight of 10 lb. or greater. Seventy per cent of these 23 females had four pregnancies or more. In the nondiabetic group, 20% of 25 females over age 40 reported one or more pregnancy with baby birth weight of 10 lb. or more. Only 28% of these 25 females had four pregnancies or more. The evidence seems to indicate that more diabetic women give

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The data presented suggest that definitive studies are needed to identify factors influencing the onset and progress of complications due to diabetes and

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Total	60	195	58.3	29.2	56.7	33.8	50.0	17.4	73.3	46.2
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Comment

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In contrast to the usual findings in medical literature, results of this study show that males are just as likely to have diabetes mellitus as females and that, while most known diabetics are past middle age, the condition is found in all age groups. These data also indicate that the diabetic has three times as many relatives who have diabetes as compared with the nondiabetic and that about two-thirds of the diabetics have one known diabetic relative or more.

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Summary

The status of the Oxford study groups of 1946-1947 has been reviewed after seven years. Despite the attrition of time and migration, the group with diabetes increases as persons in the blood sugar suspect group develop diabetes eight times faster than the normal control group. Results of the comprehensive physical examinations of the diabetic group and the nondiabetic group comprising the blood sugar suspect and normal control groups have been studied. Abnormalities are significantly more frequent in the diabetic group in comparison with the nondiabetic group, particularly in the eyes,

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heart, and great vessels. The study serves to establish a base line and points to a need for future comparative evaluations where pathological findings may be correlated with degrees of control.

77 Warren St. (Dr. Wilkerson).

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LONG-TERM ANTICOAGULANT THERAPY IN CORONARY DISEASE

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Anticoagulant therapy in acute myocardial infarction is now well established, according to most authorities on the subject. Long-term therapy after the acute attack requires accumulation of statistics over a long period of years to make any conclusions valid. This is not an easy matter to evaluate, because there are countless variables entering into the natural history of these cases of coronary artery disease. The information available would seem to show that patients given long-term treatment are favorably affected.

Review of Literature

In the last few years, reports have been appearing in the literature on experiences with anticoagulants in the long-term treatment of coronary disease. In March, 1954, Nichol and co-workers¹ reported 295 patients with coronary disease on long-term anticoagulant therapy. The duration of treatment in this series ranged from three months to seven years. To summarize their results, in these 295 patients there were 41 deaths (13.8%) and 7 recurrences, while in the control group of 110 patients (after anticoagulant therapy was stopped) there were 37 deaths (33%) and 14 recurrences.

In April, 1955, Foley and co-workers² reported on 300 outpatients with myocardial infarction treated with long-term anticoagulant therapy. They summarized 23 cases as follows: In 11 patients who had had two or more episodes before therapy and who

An attempt has been made to evaluate the effectiveness of continuing the administration of anticoagulants over a period of years in the treatment of coronary heart disease. In a series of 521 patients there was a group of 408 with myocardial infarction, within which it was possible to make comparisons between 268 patients who kept up the anticoagulant treatment and 140 (pseudocontrols) who discontinued such treatment after three months to 10 years. Mortalities at both the 5-year and 10-year epochs were higher for the pseudocontrols (29 and 36%) than for those who continued the treatment (21 and 25%). The 5-year and 10-year mortality figures in the series available in the literature in which anticoagulants were not given (true controls) are 44 and 68% respectively. The conclusion that anticoagulant therapy improved the prognosis for the patient was corroborated by other comparisons within this series as well as comparisons with data published by other investigators. Anticoagulants in the dosages here used caused 58 minor and several rather severe hemorrhagic episodes but no fatalities.

were not given anticoagulant therapy, over a period of 587 months there were 49 thromboembolic episodes (including 30 instances of myocardial infarction and 10 of pulmonary embolism); when anticoagulants were given, over a period of 393 months there were 3 thromboembolic episodes. In 12 patients who had had one episode and who were not given anticoagulant therapy, over a period of 41 months there were 12 thromboembolic episodes; when anticoagulants were given, over a period of 554 months there was only one episode.

Also in 1955, Suzman and associates³ reported on 82 cases treated with anticoagulants for periods of 3 to 76 months after coronary thrombosis. We have summarized their results as follows: In the long-term group, the mortality was 7.3% and there were 7 recurrences (8%); in the control group, the mortality was 33% and there were 24 recurrences (27%). In patients with severe disease who were given long-term therapy, the mortality was 9% and there were 7 recurrences; in the control patients with severe disease, the mortality was 46.7% and there were 21 recurrences. The mortality was 14.3% before therapy was started in patients with severe recurrent disease; it was 66% in the control patients with severe recurrent disease.

In 1956, Keyes and co-workers⁴ reported the following mortality in connection with long-term anticoagulant therapy after myocardial infarction: After one year had elapsed, in control patients with a single episode the rate was 16.1% and in those with recurrent disease it was 31.2%, while in patients given anticoagulants the rates were 4.2 and 8.0% respectively. After two years, in control patients with a single episode the rate was 27.9% and in those with recurrent disease it was 39.6%, while in patients given anticoagulants the rates were 5.6 and 8.0%. After three years, in control patients with a single episode the rate was 31.7% and in those with recurrent disease it was 52.1%, while in patients given anticoagulants the rates were 8.4 and 10.0%. After four years, in control patients with a single episode the rate was 41.4% and in those with recurrent disease it was 62.5%, while in patients given anticoagulants the rates were 8.4 and 12.0%.

In their series, the single infarction group consisted of 186 controls and 71 treated patients. In the recurrent infarction group there were 48 controls and 50 treated patients. The period of treatment ranged from six months to five years. These workers found the death rate in the group with single infarction to be three times greater when anticoagulants were not given. They also found that in the recurrent infarction group the death rate was five times greater without anticoagulant therapy.

Manchester,⁵ in December, 1957, reported an interesting study on a group of patients given long-term treatment with anticoagulants after myocardial infarction and a control group given an ascorbic acid placebo; there were approximately 200 patients

in each group. He found the incidence of subsequent infarction to be three times greater in the control group than the treated group; the mortality was eight times more in the control group than the treated group.

Manchester found that the development of angina pectoris subsequent to myocardial infarction was the same in his treated as in his control group. In the anticoagulant group this occurred in 74 (36.2%) and in the control group in 72 (36%). In the anticoagulant group 38 (51.3%) showed improvement as indicated by increased tolerance in walking and performing the Master's two-step test. In the control group 20 (27.5%) showed improvement. In the anticoagulant series there were 4 deaths (5.4%); in the control series there were 30 (41.6%).

Nichol and co-workers⁶ have presented a pooled clinical investigation in 1,091 patients with coronary atherosclerosis treated with anticoagulants for 3 to 100 months, for a total of 24,454 months. The average duration of therapy was 22.4 months. Their results were as follows:

In patients without frank infarction (impending infarction), in the treated group of 96 patients there were six deaths, or a mortality of 6.2%; in the abandoned group 32 patients stopped treatment after 315 months and, in a follow-up study over 732 months, the mortality was 18.7%; and in the control group 10 patients were observed for 269 months and there were four deaths, or a mortality of 40%.

In patients who had had one infarction, in the treated group of 735 patients there were 73 deaths, or a mortality of 10%; in the abandoned group 205 patients stopped treatment after 2,423 months and, in a follow-up study over 3,708 months, the mortality was 18.5%; and in the control group 297 patients were observed for 12,376 months and there were 110 deaths, or a mortality of 37%.

In patients who had had multiple infarctions, in the treated group of 260 patients there were 52 deaths, or a mortality of 20%; in the abandoned group 82 patients stopped treatment after 1,246 months and, in a follow-up study over 950 months, the mortality was 56.1% and three were lost to follow-up; and in the control group 110 patients were observed for 3,276 months and there were 42 deaths, or a mortality of 38.1%.

Methods and Material of Present Study

In our clinic, long-term anticoagulant therapy after acute myocardial infarction was initiated 15 years ago. Our study of the accumulated cases has taken well over a year, and no new cases have been included in this study since June, 1956. We interviewed all active patients, obtained hospital records and private physicians' information, and finally contacted patients who had discontinued therapy personally wherever possible. Detailed methods of anticoagulant therapy as used in our clinic have been recently published.⁷

Our report of 521 cases comprises the following groups: (1) long-term anticoagulant therapy for myocardial infarction, 268 patients, and pseudo-

control (discontinued therapy), 140; (2) long-term therapy for coronary insufficiency, 55, and pseudocontrol, 29; and (3) long-term therapy for angina, 23, and pseudocontrol, 6.

We have purposely used the term "pseudocontrol" rather than control in our series of patients who discontinued therapy. The majority of authors have used such patients as controls. This type of control subject, not only in our series but in those of others, has had the beneficial effects of anticoagulant treatment for varying periods before such therapy was stopped. Such beneficial effects from even brief "long-term" therapy are evidenced by lowered mortality figures, as compared to those of completely untreated patients. This will be shown later.

comparing those given anticoagulants for three months to 10 years with those in whom this treatment was discontinued. This group excludes any patient who developed coronary thrombosis. Four (7.3%) of the 55 treated patients died, as compared to 19 (12.9%) of 147 patients not given anticoagulants as recorded in the study of Master and Jaffe. The group recorded in table 4 is not large, but the definite improvement of angina in 27.3% of patients in the treated group with coronary insufficiency and in 30.4% in the treated group with angina without coronary insufficiency is certainly worthy of note.

Hemorrhage.—In the 268 patients on active long-term therapy, the following minor hemorrhagic episodes were noted: purpura (mild), 13; hema-

TABLE 1.—Comparison of Mortality Estimated for Each Year After Myocardial Infarction*

Time Elapsed, Yr.	Infarction	Anticoagulant Therapy (Present Study)				Control Group, Mortality (Literature)		Pseudocontrol Group (Present Study)			
		Cases, No.	Deaths, No.	Mortality, %		Keyes et al., ⁴ %	Av., %	Doing Well, No.	Deaths, No.	Mortality, %	
				Yearly	Total					Yearly	Total
1.....	S	213	14	6.2		16.1		109	6	5.5	
	R	39	2	4.9		31.2		24	1	4.2	
2.....	S	204	8	3.8		27.9		98	12	12.3	
	R	18	3	14.3		39.6		23	0	...	
3.....	S	173	5	2.8		31.7		82	6	7.3	
	R	10	3	23.1		52.1		19	2	10.5	
4.....	S	130	6	4.4		41.4		64	5	7.8	
	R	7	2	22.2		62.5		15	1	6.7	
5.....	S	101	6	5.6	18.3		44.2	52	6	11.5	32.1
	R	6	4	40.0	21.0†			14	2	14.3	29.3†
6.....	S	78	5	6.0				35	2	5.7	
	R	2	0	...				9	3	33.3	
7.....	S	52	3	5.5				25	1	4.0	
	R	1	0	...				5	1	20.0	
8.....	S	41	1	2.4				16	1	6.3	
	R	1	0	...				4	1	25.0	
9.....	S	30	0	...				2	0	...	
	R	0	0	...				1	0	...	
10.....	S	10	0	...	24.6‡		67.6	1	0	...	35.7‡

* Tabulated in percentage of total patients on anticoagulant therapy for any one year.
† S = Single attack of myocardial infarction prior to anticoagulant therapy; R = recurrent (two or more) attacks before treatment was instituted.
‡ Combined rate for single and recurrent.

Results

In the 268 patients who received long-term anti-coagulant therapy after myocardial infarction, there were 62 deaths, or 23.1% of the total series, and 10 recurrent attacks with recovery, or 3.7% of the total series. Of those who died while on anticoagulant therapy, the last-recorded prothrombin time was below 20 seconds in 28 cases. Table 1 summarizes data for this series.

Table 2 summarizes the data in treated patients with classification as to severity, length of time on therapy, and age group. The mortality, by year after therapy was stopped, for patients in the pseudocontrol group is recorded in table 3. It is interesting in this series to note that the mortality is highest in the first few years after discontinuance of therapy. Of the total of 52 who died, 42 patients died within two years after stopping anti-coagulant therapy.

In table 4 are listed the results of treatment in patients with acute coronary insufficiency and angina without attacks of coronary insufficiency,

toma, 8; epistaxis, 13 (3 cases of multiple episodes); conjunctival hemorrhage, 5; rectal hemorrhage, 10 (1 case of multiple episodes); hemorrhage from gums, 7 (1 case of multiple episodes); and retinal hemorrhage, 2—a total of 58.

In regard to major hemorrhagic episodes, anti-coagulant treatment was temporarily discontinued in two patients who had hematuria and who required hospitalization and blood transfusion. Both are continuing anticoagulant therapy. One episode of rectal bleeding caused the patient to stop this treatment for one year, but it has now been restarted. In patients in whom anticoagulant therapy was permanently discontinued, there were six instances of nonfatal bleeding, including one rather severe case. One patient with slight gastric hemorrhage died three months later of cancer of the stomach.

Recently, unexpected gastric hemorrhage during anticoagulant therapy has, on investigation, revealed an occult visceral malignancy.⁸ Hemorrhage has been the main argument against anticoagulant therapy. With the advent of vitamin K₃ preparations,

the possibility of severe hemorrhage is becoming less and less an objection to this therapy. In many instances, a small dose of vitamin K₁ will lower the prothrombin time toward normal within a few hours. It is to be noted, then, that in the entire series there were no deaths due to hemorrhage.

Comment

Interesting statistics on 25-year follow-up studies after myocardial infarction are appearing in the literature. These patients have not been treated with anticoagulant therapy and therefore make a good control group for the present study.

Katz and co-workers,¹⁰ in 1949, reported on 488 patients with myocardial infarction, in some of whom follow-up studies were done for variable periods up to six years. They estimated that about 25% died within the first two months, 50% by the end of the first year, and 75% by the end of the third year.

TABLE 2.—Age, Length of Therapy, and Severity of Disease in 192 Patients on Long-term Anticoagulant Therapy After Myocardial Infarction

Length of Therapy, Yr.	Age Group, Yr.						Severity			
	30-39	40-49	50-59	60-69	70-79	80-89	Mild	Mod-erate	Se-vere	Re-cur-rent*
1-2	3	7	5	3	...	...	8	7	1	2
2-3	1	8	18	13	2	...	16	18	7	2
3-4	...	5	10	11	1	...	7	7	7	2
4-5	...	3	9	12	1	...	11	10	2	4
5-6	...	1	12	7	2	...	8	9	4	1
6-10	...	6	18	17	7	1	6	30	13	2
10-15	...	...	1	4	1	2	1	2	...	5
Total	1	26	75	69	17	4	57	83	34	18

* Prior to therapy.

In 1951, Sigler¹⁰ reported on a 25-year follow-up study of 1,700 patients with coronary disease. Of the 1,208 patients in Sigler's series who had at least one attack of coronary occlusion, 785 were still alive when this report was compiled. In this series, 45.3% of the males and 37.8% of the females were alive five years or more after the first attack; 10.7% and 10.4%, respectively, were still alive 10 years or more, and 2.1% of the males were still alive 15 years or longer.

Also in 1951, Master and Jaffe¹¹ reported on survival rates of 412 patients after acute coronary occlusion. They found that 40% made a complete recovery and 25% a satisfactory recovery. Of those who recovered completely, 40% survived over 5 years and 25% survived over 10 years. They reported that the best prognostic guide appears to be the patient's symptoms.

In 1956, Richards and associates,¹² in reporting their own series published following data: Thirty-eight patients died within one month. Forty-nine per cent (79 of 162 patients or 39.5% of the total group) survived 5 years; 31% (50 of 162 patients) 10 years; 14% (23 of 162 patients) 15 years; and 5% (8 of 162 patients) 20 years. Six patients lived more than 25 years after acute infarction.

According to these authors, the best index to long-term prognosis after myocardial infarction is the degree of recovery of the patient after the acute

TABLE 3.—Mortality of Pseudocontrol Subjects in Years After Discontinuance of Anticoagulant Therapy*

Time Elapsed, Yr.	Infarc-tion†	Doing Well, No.	Died, No. (Total, 32)	Mortality, %
1.....	S	70	28	40.0
	R	17	5	29.4
2.....	S	55	5	9.1
	R	10	4	40.0
3.....	S	33	3	9.1
	R	7	1	14.3
4.....	S	23	3	13.0
	R	6	1	16.7
5.....	S	13	1	7.7
	R	4	0	...
6.....	S	5	1	20.0
	R	2	0	...
7.....	S	2	0	...
	R	1	0	...

* Patients had been previously treated with anticoagulants for three months to 10 years.

† S = Single attack of myocardial infarction prior to anticoagulant therapy; R = recurrent (two or more) attacks before treatment was instituted.

period of infarction. Of the 55 patients in the series of 200 who had "complete" clinical recovery after myocardial infarction, 45 (85%) were alive after 5 years, 31 (56%) after 10 years, and 6 (11%) after 25 years.

These authors also presented the statistics shown in table 5, which include untreated patients with long-term disease in their own group as well as in others' series.

The authors mention that the patients reported in their own series had disease of more than average severity, due to an element of selection by consultation. A considerable number of patients

TABLE 4.—Results of Treatment in Patients with Acute Coronary Insufficiency and Angina Without Coronary Insufficiency

	Acute Coronary Insufficiency		Angina Without Coronary Insufficiency	
	Anti-Coagulant Therapy	Discon-tinued Therapy	Anti-Coagulant Therapy	Discon-tinued Therapy
	No.	%	No.	%
Total cases	55		29	
No angina	48		23	
Died	4	7.3	3	10.3
Angina persistent or worse	3	5.5	3	10.3
Definite improvement in angina	15	27.3	1	3.1
Recurrences	8	14.5	2	6.9

* All were improved on anticoagulant therapy before it was withdrawn.

with coronary disease in our series who were given anticoagulants were referred to us by their physicians because of continuing or developing symptoms after the initial attack. It is our belief, then, that in regard to severity of disease our own series, in a general way, is comparable to that of Richards and associates.

We have briefly reviewed the literature both for statistics on long-term anticoagulant therapy after

myocardial infarction and also for survival rates of patients not given anticoagulant therapy in 25-year follow-up studies now available.

The 10-year mortality of 67.6%, as averaged from the literature, in patients who did not receive anticoagulants would seem entirely disproportional to the mortality of 35.7% in our patients who discontinued anticoagulant therapy after varying intervals. The number of patients (140) in the pseudocontrol group, especially toward the end of their 10-year period, is, admittedly, small. A large series must be reported before such statistics would be comparable. Until such time, certainly no conclusions can be drawn as to possible benefit in later years in those patients who received anticoagulants for varying intervals before discontinuance of this therapy. In all events, mortality in patients on long-term anticoagulant therapy would seem appreciably better than in the pseudocontrol subjects and certainly far superior to those in the completely untreated group. We would feel, then, that in this study of 428 cases our statistics may be of some significance.

TABLE 5.—Survival Rates in Patients* with Myocardial Infarction¹²

Author	Cases, No.	5-Yr. Survival, %	10-Yr. Survival, %
Bland, E. F., and White, P. D.: J. A. M. A. 117:1171-1173 (Oct. 4) 1941	162	49	31
Billings, F. T., Jr., and others: Am. J. Med. 7:336, 1949.....	143	45	30
Smith, C.: J. A. M. A. 151:167-170 (Jan. 17) 1933.....	85	66	20
Cole, D. R., and others: Circulation 9:321, 1954.....	285	67	44
Weiss, M. M.: Am. J. M. Sc. 231:9, 1956.....	211	52	37

* Includes only those who lived at least one month after acute infarction.

The question as to selection of cases in which initiation of long-term anticoagulant therapy is indicated has been a subject of discussion. Askey¹³ has reflected the opinion of quite a number of observers in stating that continuous long-term therapy is indicated for patients who survive severe or recurrent myocardial infarction or even for those who develop the anginal syndrome not responding to other treatment. In our own series such criteria were followed in many cases. However, for purposes of later comparable statistics certain patients have been placed routinely on such therapy after their first attack.

In the last four years an increasing number of reports has appeared in which statistical studies were given on long-term anticoagulant therapy after coronary thrombosis. In each instance, conclusions drawn were favorable and, at times, enthusiastic. In our own series it is our belief that the statistical evidence would certainly appear favorable and warrants further study. However, we stress the fact that the natural course of coronary disease with all of its variables, including environmental and emotional factors, makes the statistics in this condition difficult to obtain and interpret. Conclusions must be drawn with the greatest caution and objectivity.

Summary

In the present study, there were 268 patients who were given long-term anticoagulant therapy after myocardial infarction and 140 in whom this treatment was discontinued. Eighty-one of the long-term group were treated from 5 to 15 years with anticoagulants. Of these patients, 23.1% died from cardiac disease 1 to 15 years after infarction and 3.7% had recurrences and survived.

In the study of five-year statistics, the mortality in the treated group (combined single and recurrent attacks) was 21.0%, compared with 44.2% in the true control group (as averaged from the literature), in which patients had never received anticoagulant therapy. It is interesting to note in our "pseudocontrol" or discontinued-therapy group that the five-year mortality was 29.3%. Likewise, in a study of 10-year statistics, the mortality in the treated series was 24.6%, compared with 67.6% in the true control group. In the pseudocontrol group the mortality was 35.7% at the 10-year level.

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Mrs. Frances Horney, Miss Arden Kesmodel, and Miss Louise Manzo provided technical assistance in this study.

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USE OF NITROFURANTOIN IN CHRONIC AND RECURRENT URINARY TRACT INFECTION IN CHILDREN

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During the past four years, nitrofurantoin has been administered therapeutically or prophylactically for periods up to 27 months to 100 children with chronic and recurrent urinary tract infection. All these patients were given follow-up examinations for at least six months. A long period of observation and treatment was found necessary for adequate evaluation and control of this disease. Nitrofurantoin was found to be an effective agent for this disease because of its broad antimicrobial spectrum and its success in controlling most infections initially and other infections by administration for a longer period. Prophylactically, it was successful in suppressing recurrent infection. No serious toxic effects were noted, and there was minimal development of bacterial resistance to this drug.

Recurrent or chronic persistent urinary tract infection is the commonest pediatric urologic problem. Since the symptoms may be minimal, or in some cases entirely absent, the disease is undoubtedly more frequent than generally realized. It is our belief that recurrent infection is not a series of isolated episodes but repetitive exacerbations of one underlying and continuous disease. Because of the frequency with which pathogenic organisms are recovered from urine samples taken directly from the kidney, and because of the high incidence of vesicoureteral reflux in patients with symptoms of cystitis, potential renal infection must be considered even when the syndrome seems to consist only of cystitis. Therefore, we have used the term urinary tract infection, rather than cystitis or pyelonephritis, in discussing the disease in these children.

We feel that, if urinary tract infection is allowed to progress, the atrophic changes of chronic pyelonephritis may eventually develop. The common lay belief that children "grow out of" acute episodes of infection is probably at least partly true, since the incidence of infection in the adolescent period is lower. Nevertheless, we feel that the damage from these prepubertal infections may persist into later life. This is difficult to evaluate accurately. In this series, 96% of the cases of uncomplicated urinary tract infection occurred in girls. During a similar period, of 100 adults seen in consultation for pyelonephritis uncomplicated by other urologic disease or pregnancy, 65% were women. Nine of 14 patients in this group with severe atrophic changes were women. During this four-year period, six autopsies at the Western Pennsylvania Hospital,

Nitrofurantoin was used in the treatment of chronic or recurrent infection of the urinary tract in 100 children. In each case the diagnosis was confirmed by cystoscopy, urography, and the culturing of a pathogenic organism from the urine. The series included only children who were followed for at least six months and who were able to tolerate the medicament in adequate dosages. The therapeutic dosage was 6 to 10 mg. and the prophylactic dosage 1 to 5 mg. of nitrofurantoin per kilogram of body weight per day. In 36 children all manifestations of infection were stopped by this treatment, without complications or recurrences. In more than half of the patients who showed a good initial response, however, the infection recurred. The recurrence was commonly asymptomatic, being detected by urinalysis and culture. Two case histories illustrate the persistent nature of this infection and the need of continuing prophylactic treatment for at least three months after the urine has become sterile.

performed on patients from 20 to 50 years of age, revealed chronic pyelonephritis uncomplicated by other urologic disease as the primary cause of death. This constituted about 1% of the autopsies. Five of the six patients were women.

The time to preserve renal tissue is at the onset of disease. Therefore, we feel it is important to treat these infections promptly and adequately even though the symptoms may be mild or the abnormal findings few other than pyuria and bacteriuria. Nitrofurantoin (Furadantin) has characteristics that make it a valuable drug for long-term administration to control urinary tract infection. These include its lack of toxicity, wide range of antibacterial effectiveness, and reduced tendency to induce development of bacterial resistance to the drug.¹ Our previous studies,² indicating that nitrofurantoin is a suitable and effective urinary antimicrobial in children, were confirmed by a study of 52 children in 1956 by Ericsson and co-workers³ in a Swedish children's hospital. Successful nitrofurantoin treatment of urinary tract infections in children also has been reported by several other clinicians in the

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Read before the Section on Pediatrics at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

United States, including Carrol in 1955,¹² Fetter and Warren in 1956,¹³ Stewart and Rowe in 1956,¹⁴ and Jawetz and associates in 1957.¹⁴

The ability of a drug to sterilize the urine immediately and to produce clinical improvement is not a final criterion of efficacy, since renal paren-

TABLE 1.—Patients with Urinary Tract Infection and Duration of Treatment

	Uncom- plicated, No.	Com- plicated, No.
Total	72	28
Boys	3	8
Girls	69	20
Followed >12 mo.	45	21
Received nitrofurantoin for >6 mo.	41	22
Receiving nitrofurantoin at time of evaluation ..	24	14

chymal infection may persist despite sterile urine.¹⁴ The control of infection can be presumed only after a long period of observation. This study was made and is being continued to determine the effectiveness of nitrofurantoin in controlling these chronic urinary tract infections in children for a prolonged period.

Materials and Methods

One hundred infants and children with chronic or recurrent urinary tract infection were treated with nitrofurantoin for variable periods up to 27 months (table 1). The therapeutic dosage was 6 to 10 mg. and the prophylactic dosage 1 to 5 mg. of nitrofurantoin per kilogram of body weight daily. The diagnosis was based on clinical history and examination, including cystoscopy, urography, urinalysis, and a urine culture demonstrating a pathogenic organism. A severe anatomic abnormality of the urinary tract or neurogenic bladder disease was present in the 28 patients classified as having complicated urinary tract infection. Those children who had follow-up periods of less than six months, who received inadequate medication due to intolerance, or on whom concurrent surgery was performed are not included in this report. Patients who voided from a rectal reservoir or who had a foreign body in the urinary tract were not included because no more than transient sterilization of the urine was accomplished in such cases. Among the 72 patients with uncomplicated urinary tract infection, there were many with minor abnormalities, such as vesicoureteral reflux, reduced urethral caliber, or cystitis cystica.

The follow-up studies lasting 6 to 48 months included clinical observation, urinalysis, urine culture, and further urologic study when indicated. Periodic blood examinations were carried out. Of the 100 patients, 66 had follow-up studies of over one year, 10 of these of over three years. No case was considered controlled unless the urine was sterile and the centrifuged urinary sediment microscopically normal. We feel that the method we used to evaluate urine cultures was satisfactory clinically. A growth of pyogenic bacteria on a two-drop plate was considered significant. Pyogenic organisms present only in a broth culture were considered

significant when they were the same as those recovered during acute clinical infection. In the absence of pyuria, using the study of Clabaugh and Rhoads,³ we disregarded the organisms of low pathogenicity commonly present in the urethra.

In some children, urinalysis showed normal findings but the culture persistently showed pathogenic organisms. If treatment was discontinued in these children an exacerbation of clinical infection often occurred. Therefore, we have considered a culture of a pyogenic organism to be significant in all but a few isolated instances, and, in the final determination of those cases considered controlled, no culture contained pyogenic bacteria.

Results

Nitrofurantoin was successful in controlling the urinary tract infection in 82% of these 100 children (table 2). In the group without complications it was 92% successful. Recurrences were either eliminated or reduced in incidence, duration, and severity. By readministering or increasing the dosage of nitrofurantoin the infection was controlled again in all but six patients. In three of these, control was obtained by another antimicrobial. While the results were not as satisfactory in patients with a marked anatomic abnormality, we believe it significant that the infection was controlled in 57% of these patients. In two patients infection was controlled prior to pyeloplasty, facilitating postoperative recovery. Other patients, whose infections could not be classified as controlled, had variable degrees of clinical improvement.

Nitrofurantoin was administered for long periods to patients whose infections were resistant to all other antimicrobials, and this drug eventually controlled these infections in seven children (table 3). Seven patients whose infection is not now controlled are currently receiving nitrofurantoin therapy of 3 to 13 months' duration.

This study confirmed our opinion that urinary tract infection is a persistent disease, since infection

TABLE 2.—Results of Nitrofurantoin Treatment in Chronic Urinary Tract Infection

	Uncom- plicated, No.	Com- plicated, No.
Controlled		
No recurrence	36	8
Recurrence with prophylactic dosage, recontrolled by therapeutic dosage	6	5
Recurrence when nitrofurantoin was discontinued, recontrolled by readministration	24	3
Recurrence when nitrofurantoin was discontinued, recontrolled by administration of another antimicrobial	3	0
Not controlled	3	12

recurred in more than half of the patients who showed a good initial response (table 2). This frequency of recurrence increases with the length of follow-up period. In a considerable number of these children the recurrence was asymptomatic and discovered only by urinalysis and culture. Unfortunately, it is difficult to get some parents to bring their children back for these visits when the latter

are asymptomatic or have few symptoms. Therefore, the true incidence of recurrence is undoubtedly higher than we have reported.

Nitrofurantoin has been effectively administered prophylactically for as long as 27 months, with infrequent development of drug-resistant bacteria. This was demonstrated, first, by the successful retreatment with nitrofurantoin of recurrent infection in 27 children and, second, by successful control of recurrent infection in children taking a small prophylactic dosage, by increasing the dosage to a therapeutic level. Nineteen of the 24 patients in the group with uncomplicated infection and 8 of the 14 patients with complicated disease are currently taking nitrofurantoin because of recurrent infection after the drug was withdrawn. The infections are controlled at this time apparently because nitrofurantoin treatment is being continued. Therefore, in about one-quarter of the entire reported series of patients, more or less continuous nitrofurantoin therapy has been required to control infection. It was our observation that, while 1 to 2 mg. per kilogram of body weight per day was effective in preventing recurrence of infection in most patients, some of them required a daily dosage of two to three times that amount.

The broad antibacterial spectrum of nitrofurantoin is important because of the variety of organisms encountered initially (table 4). Frequently, a different organism may be encountered either during the course of treatment or when infection recurs after treatment is discontinued. This change of organism during the course of observation occurred in 39 of our patients. A total of 210 organisms was encountered initially, during recurrence of infection, or when the organism changed during treatment in these 100 patients (table 5). The tabulated results are not synonymous with a clinical control of infection, since in some cases when an organism was

was readministered and the alopecia did not recur. One patient who became drowsy on two occasions while taking nitrofurantoin was not treated with it again. In several patients, a mild rash appeared during treatment but the drug was not withdrawn and the rash disappeared. There was one Negro

TABLE 4.—*Bacteriological Findings in Patients with Urinary Tract Infection*

Initial organism	Uncomplicated, No.	Complicated, No.
<i>Esch. coli</i>	32	10
<i>Proteus</i>	28	16
<i>A. aerogenes</i>	4	0
<i>Paracolonbacterium</i> species	3	1
<i>Ps. aeruginosa</i>	3	3
Gram-positive cocci	9	2
Mixed infection	7	4
Change in organism during treatment or when infection recurred	24	15

patient, but no alteration in the blood findings of any patient was observed. Variable degrees of gastrointestinal intolerance, manifested by anorexia, nausea, and vomiting, were seen. The incidence of intolerance is difficult to determine, since whether it is tolerated may depend on the persistence of the parent in administering the medicament. When the parents are convinced of the necessity of administration the incidence of complete intolerance is low, although the daily dosage may have to be reduced. The newer flavored suspension is better tolerated. Those who refuse the suspension may accept a tablet crushed over a spoonful of syrup or honey or mixed with a carbonated beverage, peanut butter, or fruit preserves.

Report of Cases

Three case reports, representative of the various problems encountered, are presented. The first shows the control of recurrent infection of the urinary tract for a two-year period by vigorous and prolonged nitrofurantoin therapy.

CASE 10.—A 3-year-old girl was first seen on Sept. 23, 1953, with a history of recurrent abdominal pain, frequency, dysuria, and pyuria. The condition could be temporarily relieved by antimicrobials. She was acutely febrile at that time and was receiving sulfisoxazole (Gantrisin) and penicillin. Physical examination was normal except for a temperature of 103 F (39.4 C). Cystoscopic examination showed nothing abnormal, except for a urethral stricture which was dilated. The upper urinary tract was normal. Urinalysis revealed pyuria. *Escherichia coli* and hemolytic streptococci were obtained on culture of the urine. Nitrofurantoin was given for a four-day period, but one month later pyuria was still present although the patient was asymptomatic. Nitrofurantoin therapy, 10 mg. per kilogram of body weight daily, was administered for a week and continued at half that dose for the next two months. Cultures during therapy and at its conclusion were sterile. During 1954, the patient had no urinary symptoms and six urinalyses and cultures showed no recurrence of infection. On May 31, 1955, occasional enuresis was noted. A urinalysis demonstrated pyuria, and a culture again showed *Esch. coli*. Nitrofurantoin was again prescribed, first 8 mg. and later 4 mg. per kilogram of body weight daily for a total of 10 weeks. Urinalyses and cultures during and at the conclusion of therapy showed no further infection. During the remainder of 1955 and 1956 and up to March 14, 1957, urinalyses showed normal findings and the cultures were sterile.

TABLE 3.—*Summary of Infections Successfully Controlled Only by Long-term Nitrofurantoin Therapy*

Case No.	Complication	Original Organism	Time Required for Control, Mo.
1	Neurogenic bladder	<i>Esch. coli</i>	13
2	Neurogenic bladder	<i>Ps. aeruginosa</i>	10
3	Neurogenic bladder	<i>Ps. aeruginosa</i>	11
4	None	<i>Proteus</i>	6
5	Cystitis cystica	<i>Ps. aeruginosa</i>	5
6	Cystitis cystica; vesicoureteral reflux	<i>Proteus</i>	6
7	Cystitis cystica; previous nephroureterectomy for hydronephrosis	<i>Esch. coli</i>	3
8	Previous nephrectomy for renal vein thrombosis	<i>Proteus</i>	6
9	None	<i>Ps. aeruginosa</i>	6

eliminated it was simultaneously replaced by another. They do indicate that nitrofurantoin is effective against a wide range of organisms.

No serious toxic effects were encountered in any patient in this series. Two patients noted patchy alopecia, and nitrofurantoin was withdrawn. On recurrence of a urinary tract infection clinically resistant to all other antimicrobials, nitrofurantoin

The next case illustrates infection controlled only by continuous prophylactic nitrofurantoin therapy. Infection recurred during prophylactic administration, which necessitated an increase in the dosage for control.

CASE 11.—This 8-year-old girl was first seen on Sept. 10, 1953, with a history of intermittent fever, frequency, and pyuria for five years. Treatment with various antimicrobials produced only transient relief. Urinalysis demonstrated pyuria, and urine culture showed a growth of *Esch. coli*. An anatomically normal urinary tract was seen on cystoscopy and pyelography. Nitrofurantoin, 8 mg. per kilogram of body weight daily, was given for two weeks. Urinalyses and cultures showed normal findings until Jan. 11, 1954, when pyuria recurred and a urine culture again grew *Esch. coli*. Nitrofurantoin, 8 mg. per kilogram of body weight per day, was given with a good result and the dosage was gradually reduced to 2 mg. per kilogram of body weight daily, but on Aug. 6, 1954, pyuria and bacilluria with *Esch. coli* recurred. An increase in dosage to the original amount controlled the infection by Aug. 30, 1954, and the dosage was reduced to 4 mg. per kilogram of body weight per day. On this dosage the infection did not recur, and nitrofurantoin therapy was discontinued on March 24, 1955. She did not return until Dec. 31, 1956. She was asymptomatic, but a few pus cells were found on urinalysis, together with a marked bacilluria with *Esch. coli*. Nitrofurantoin, 9 mg. per kilogram of body weight daily,

TABLE 5.—Effect of Nitrofurantoin on 210 Organisms

Type of Organism	Times Encountered, No.	Eliminated by		
		Nitrofurantoin, %	Other Antimicrobial, %	Not Eliminated, %
<i>Esch. coli</i>	110	88	3	9
<i>Proteus</i>	68	72	9	19
<i>Ps. aeruginosa</i>	19	68	5	27
<i>Cocci</i>	13	84	8	8

cleared the urine, and a dosage of 3 mg. per kilogram has maintained a sterile urine. On July 20, 1957, cystoscopy and pyelography again demonstrated a normal urinary tract. There was no vesicoureteral reflux, and excretion of intravenously given phenolsulfonphthalein at that time was 65% in 30 minutes.

In case 2 (table 3), control of resistant infection was achieved by prolonged therapeutic treatment with nitrofurantoin despite the presence of a neurogenic bladder, due to meningomyelocele, and resistant organism. Recurrence was prevented for a period of one year by prophylactic treatment with nitrofurantoin.

CASE 2.—A 5-year-old girl was first seen on Sept. 23, 1955, because of incontinence. She had a meningomyelocele repaired during a previous hospitalization, but there was a residual sacral neurological inadequacy. No effort had been made to control urination, and she was constantly wet. Residual urine was 50 cc., and the capacity of the bladder was 120 cc. Cystoscopy showed evidence of chronic cystitis, trabeculation, and cellulite formation. The upper urinary tract appeared normal except for slight left ureterectasis. Urine cultures grew *Proteus* organisms. On urinalysis, the specific gravity was 1.018; the reactions for sugar and albumin were negative, but the centrifuged urinary sediment contained many pus cells. The child was made to empty her bladder by suprapubic pressure every two hours, and with this routine she remained dry during the day. Nitrofurantoin, 7 mg. per kilogram of body weight daily, was prescribed, but after three months pyuria was still present and the urine culture demonstrated *Pseudomonas aeruginosa*. During the next six months this organism was

consistently present. A course of polymyxin therapy did not eliminate the *Ps. aeruginosa*, and nitrofurantoin therapy was continued. On June 19, 1956, urinalysis gave normal results and the urine culture showed no growth. The dosage of nitrofurantoin was gradually reduced to 2 mg. per kilogram of body weight per day, and subsequent urinalyses showed no pyuria and urine culture gave negative findings. There has been no change in symptomatology, with an uninfected urine.

Conclusions

Chronic or recurrent urinary tract infection in children is a persistent disease, inherently resistant to treatment. Follow-up studies must be done for long periods of time, with frequent urinalyses and urine cultures. Nitrofurantoin is an effective and nontoxic drug which is suitable for both therapeutic and prophylactic use. There is apparently little risk of development of drug-resistant bacterial mutants. Chronic urinary tract infections should be treated with a daily therapeutic dosage of 7 to 10 mg. of nitrofurantoin per kilogram of body weight given for at least two weeks after the urine has become sterile and the urinary sediment microscopically normal. A prophylactic dosage of 2 to 4 mg. per kilogram of body weight per day is then given for at least three more months. If this dosage is not tolerated it may be reduced, but a longer period of treatment can then be anticipated. If infection recurs after nitrofurantoin has been withdrawn, the same schedule should be repeated but prophylactic treatment continued for a longer period of time. Any nonremediable abnormality of the urinary tract necessitates prolongation of treatment, depending on its severity. Nitrofurantoin therapy should not replace surgical treatment when such is indicated.

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This study was supported, in part, by a grant from the Eaton Laboratories.

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FRACTURES OF THE TIBIAL PLATEAUS

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The great majority of fractures of the tibial plateaus can be treated successfully by nonoperative means. Only a small percentage of these common injuries are best handled by open reduction.¹ The question as to which fractures are best handled by operative and which by nonoperative means is one that often tries the best surgical judgment.

These injuries are often complicated, and no matter how they are handled a certain amount of permanent residual disability may be expected. There is always a long period of severe temporary disability during their healing, since unprotected weight-bearing cannot be permitted until union is solid. In the cancellous bone of the upper tibia this is not complete for about six months.

Residual Disability

The degree of permanent disability is influenced by roughness of joint surface, presence of deformity, associated injuries to structures within and/or outside the joint, avascular necrosis, epiphysal arrest, muscle atrophy, and contractures. The greater the degree of roughness and articular irregularity produced by the fracture, the earlier and more severe will be the degenerative changes within the joint. Probably a more important factor in the late development of traumatic arthritis is the presence of valgus, varus, or back-knee deformity. Since most of these fractures involve the lateral tibial plateau, valgus deformity is more common than either of the other two.

The degree of injury to the articular cartilage, to the meniscus, and to other structures within the joint is often unsuspected prior to operation. This fact has led certain authors² to make especially strong statements as to the need for open reduction in the great majority of tibial plateau fractures.

Injuries to soft tissue structures outside the joint also have an adverse effect on residual disability. Fractures of the tibial plateau have been called "the bumper fracture" because the mechanism of injury not infrequently is that of an automobile bumper striking the lateral aspect of the knee. The bruising effect of such a blow often predisposes to thrombophlebitis, and it may actually contuse or tear the peroneal nerve; both of these complications add to residual disability.

Avascular necrosis of the detached comminuted fragments is most apt to occur after operative intervention. The blood supply to these fragments is interfered with, not only by the fracturing and

In cases of fracture of the tibial plateau the question whether to use open or closed methods of treatment must be answered by considering all the factors that may determine the degree of permanent residual disability. Since continued use of a deformed knee is likely to cause late arthritic changes, deformity that cannot otherwise be corrected is the primary indication for surgical procedures. In a series of 63 fractures of this kind, open reduction was considered necessary in only 7. The closed, nonoperative treatment used in the other 56 cases included these features: aspiration of free blood and joint fluid, manipulation with the patient under general anesthesia to correct deformity, skeletal traction, early motion, transfer from splint to brace, protection during the period of healing, and a program of exercises begun early and continued over a period of months. Unprotected weight-bearing cannot be permitted until union is solid (about six months), and a certain amount of permanent residual disability may be expected.

displacing force but also by the surgeon as he lifts them out to try to fit them together into a normal relationship.

Epiphysal arrest can occur only in the child. It is just as apt to occur in the epiphysal fracture with little displacement as in those with marked displacement. The muscle atrophy of disuse increases the disability. Muscle action is said to be the first line of defense of a joint; the ligaments are only secondary means of maintaining joint integrity.

Fibrous adhesions have been shown to form within the joint, extending from the raw bone of the fractured plateau to the patella and to the infrapatellar fat pad.³ Unless motion is begun early and continued, these adhesions become dense fibrous bands which effectively prevent motion. Actual contracture of the fibrous tissue capsule or of the fibrous tissue within the muscles, tendons, and ligamentous structures will occur when these fractures are treated by prolonged immobilization. In the young patient, stretching of these contractures about the knee is usually only a matter of normal use, but in the elderly person the contractures may lead to permanent disability. It is to be noted that a

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Read before the Section on Orthopedic Surgery at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

majority of these injuries occur in people above the age of 50. In this series, only 12 out of 63 were younger than that age.

The decision as to whether to use open or closed methods in the treatment of any individual case is based on a consideration of the factors influencing the degree of permanent residual disability. When confronted with a specific patient, the surgeon will ask himself which factors he hopes to eliminate by doing open surgery and which factors can be altered as favorably or more favorably by closed rather than open methods. It is questionable, for instance, whether the surgeon will be able to make a more smooth and regular joint surface than would have resulted had operation not been done. Early

the result is, at best, an approximation of smoothness. One may ask if the irregularity of the joint surface really is so important in the production of permanent residual disability. The defect left in the articular surface of the knee when a large osteochondritis dissecans fragment is removed commonly causes little or no appreciable arthritic change, even after many years. The same is true with the defect left after the removal of an osteocartilagenous fracture fragment. These defects in the articular surface fill in with scar tissue, and, with weight-bearing, a metaplasia occurs and fibrocartilage is formed. While not perfect, this repair appears to be serviceable as far as knee function is concerned.

Associated injury to the structures within or without the joint either do not require surgical treatment or can be done as secondary procedures at a later date. Avascular necrosis is more, not less, apt to occur with surgical intervention. Epiphysal arrest is not affected one way or the other by surgery, and muscle atrophy and fibrous tissue contractures are the result of immobilization and disuse. This leaves, then, the one factor of deformity as the major consideration in the decision to do an open reduction. If the fracture is such that the best position that can be obtained by a closed method will still result in an appreciable valgus, varus, or back-knee deformity, then open reduction is indicated. This group is a relatively small one—in our series of 63, open reduction was carried out in only 7, approximately 11%.

Nonoperative Treatment

An outline of the nonsurgical treatment of tibial plateau fractures is as follows: (1) aspiration, (2) manipulation to correct deformity, (3) skeletal traction, (4) early motion, (5) brace, (6) protection during period of healing, and (7) exercises. The patient is admitted to the hospital. The distended joint is aspirated of the free blood and joint fluid. Aspiration serves two purposes: it makes the patient much more comfortable and it facilitates physical diagnosis, since one can then more readily visualize and palpate the anatomic landmarks. Skeletal traction is then applied by means of a Kirschner wire through the os calcis or through the lower end of the tibia, and the leg is placed in a Thomas splint with a Pearson attachment. The manipulative reduction of the fracture, with the patient under general anesthesia, need not be considered an emergency. The patient is comfortable in bed in traction, and the manipulation may be done at the convenience of the surgeon and after the patient has had proper preoperative preparation and medication.

Active and active-assistive motion with the leg in traction in the Thomas splint is begun the next day. The splint is applied in such a way that by pulling a rope placed conveniently at hand the patient himself assists in moving the knee through a range

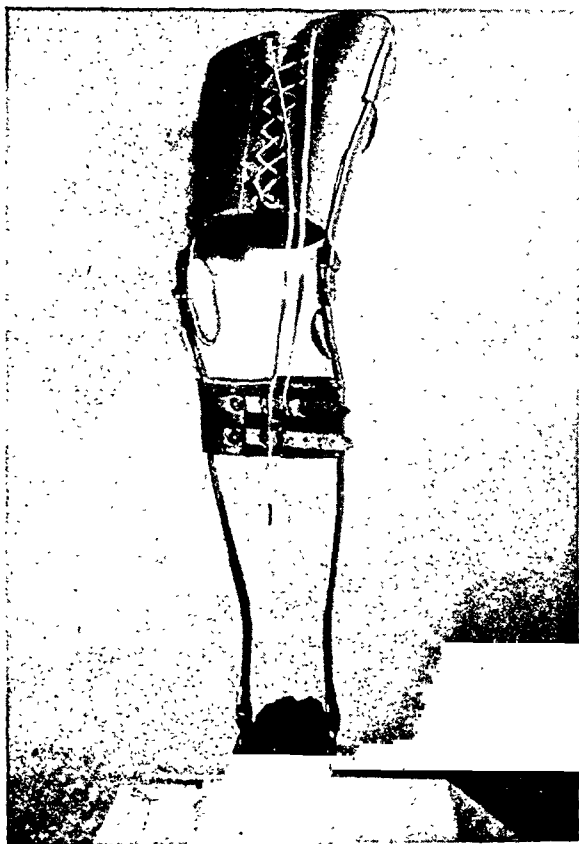


Fig. 1.—Long-leg, double-bar brace with free ankle motion, lock-knee, and adjustable pressure pads.

motion of the uninjured femoral condyle on the multiple small fragments of the tibial plateau tends to mold them into position. At operation the surgeon often finds that he must excise the lateral meniscus whether it is torn or not in order to obtain adequate exposure of the plateau fragments. He then finds that the cancellous bone has been crushed and that there is no longer enough bone substance to permit the jigsaw fragments to be put together perfectly. Some sort of bone graft usually must be used in order to support the fragments, and

of motion from complete extension to flexion of 70 to 90 degrees. At first the patient will require encouragement to permit and to perform such extension, but as the days go by it becomes easier for him to obtain the full range of motion permitted by the splint.

When this has been accomplished, a transfer from the splint to a brace may be made. This is a double-bar long-leg brace with free ankle motion, lock-knee, and adjustable medial pressure pad (fig. 1). The medial pressure pad is used to prevent any tendency toward the development of a valgus deformity and to force weight-bearing on the medial plateau only if the patient accidentally places his weight on the injured leg prior to its healing or when graduated weight-bearing is begun. At first he will wear the brace all of the time, removing it only with help for skin care. Later, the brace may be left off at night and for underwater exercises. Weight-lifting exercises to increase quadriceps power are begun very early with the brace on and must be continued over a period of months. Ambulation with brace and crutches may be permitted early, depending on the coordination and general status of the patient.

Fractures of the tibial plateaus include epiphyseal fractures; "T" or "Y" fractures; fractures of the medial tibial plateaus; and fractures of the lateral tibial plateaus. Epiphyseal fractures seldom represent any problem in residual disability, except those which result in early closure of the epiphysis. This is just as apt to occur in fractures with minimal as in those with major displacement. The fracture line often passes partly through or along the epiphyseal plate and partly through the bone, so that closure is apt to occur on one side, giving a valgus or varus deformity. Muscle atrophy, stiffness, and contractures seldom give trouble in children. Reduction of the fracture by manipulation with the patient under general anesthesia is usually not difficult, and the fracture is stable and the position readily maintained in a long sleeve cast. Only occasionally will a hip-spica cast be required. Weight-bearing with crutches may be begun in four to six weeks and nonprotected weight-bearing in three to four months.

Nearly all "T" and "Y" fractures can be handled by the nonoperative method described above. Open reduction, with or without internal fixation, need be used only in those cases in which there is wide displacement of fragments or downward displacement of one plateau only which cannot be reduced by manipulation and which, if permitted to remain, will result in a varus or valgus deformity.

Report of Cases

CASE 1.—A 74-year-old man with marked diabetes fell from a stepladder in April, 1954, and sustained depressed fracture of the posterior half of the lateral plateau (fig. 2).

Traction was used for three weeks and then a brace and crutches. He was discharged from the hospital one month after the injury. One year later, he stated that he had regained full function with ability to go up and down stairs normally and to carry on his usual activities without discomfort. I estimated that he had approximately 15% permanent partial disability because of 15 degrees of flexion deformity with further flexion possible to 80 degrees. He had a valgus deformity of 10 degrees on the involved side as compared with 5 degrees on the opposite side.

CASE 2.—A 27-year-old man fell and injured his knee in November, 1953. He had minimal displacement (fig. 3A). The cast was bivalved after two weeks, and motion was started. Six weeks after the injury, he slipped and fell on elevated stairs while walking with crutches in a half-shell cast, reinjuring his knee (fig. 3B). Manipulation was done with the patient under general anesthesia. A brace was applied and early motion started. He was last seen in November, 1956 (fig. 1C), when he stated that he had very little trouble with his knee. He had continued in his work and had recently completed a 16-mile hike. He had complete extension and flexion to 80 degrees. There was slight valgus deformity, some instability, no pain, good muscle tone, and slight atrophy.

CASE 3.—A 57-year-old man was in an automobile accident in March, 1956, when he sustained a minimal fracture of the lateral tibial plateau. A cast was applied, and



Fig. 2 (case 1).—Fracture of posterior third of lateral tibial plateau; no instability with knee in extension.

he was permitted to be up on crutches. He developed thrombophlebitis while on a business trip to the West Coast. The cast was removed and treatment of the thrombophlebitis instituted. He was transferred to Evanston Hospital seven weeks after the original injury. He had been walking on the unprotected leg. X-ray at this time showed considerable depression of the plateau (fig. 4). He was fitted with a brace, and exercises were begun. He was last seen in January, 1957, when he stated that he was symptom-free, played golf, was not restricted in his activities, and had normal range of motion, no instability, and good muscle power. He was heard from but not examined in January, 1958, when he was still symptom-free.

Fractures of the medial tibial plateau are rare in comparison with the lateral tibial plateau fractures and are handled in exactly the same way. All of those fractures which involve a small fragment only, where there is slight displacement of less than a quarter of an inch, or which involve the posterior

third or half of the plateau only and some of the fractures with depression of central fragments, with or without separation of the peripheral rim, have been treated by nonoperative methods. Surgical replacement of fragments was restricted to those cases in which the development of a valgus deformity could not otherwise be prevented.

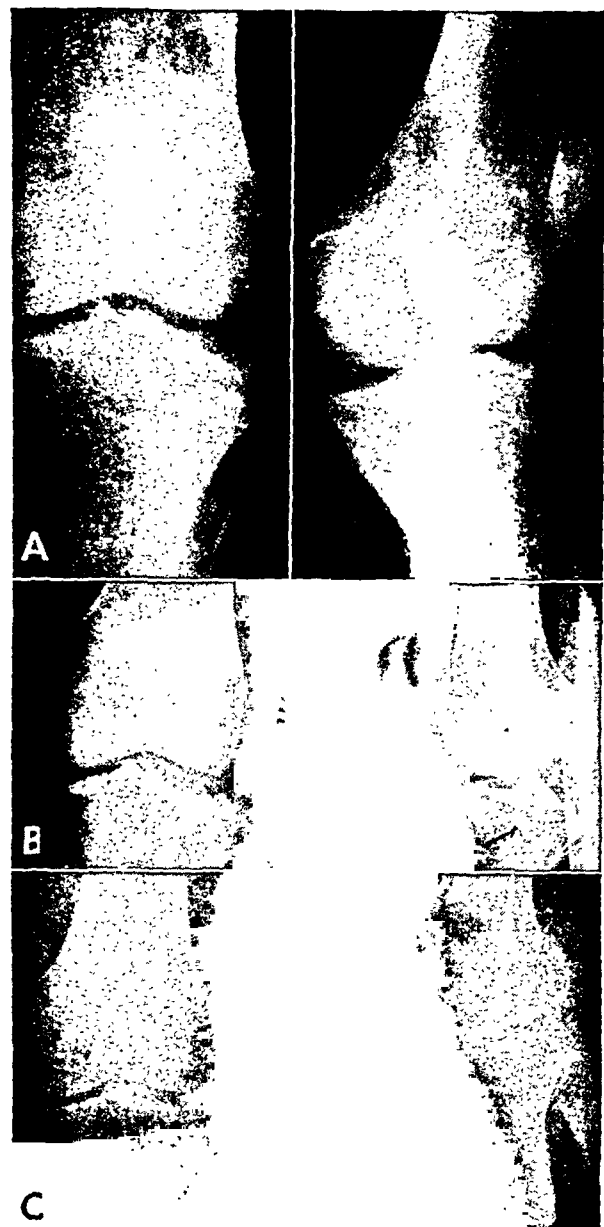


Fig. 3 (case 2).—X-rays showing, A, minimal displacement after fracture in November, 1953, B, marked crushing and comminution after second fall on Jan. 14, 1954, and, C, condition three years later.

Summary

Most fractures of the tibial plateaus result in some degree of permanent residual disability, whether operative or nonoperative treatment is

used. Continued use of the knee in valgus, varus, or back-knee deformity is probably the greatest factor in production of late arthritic changes. De-



Fig. 4. (case 3).—X-rays taken 10 weeks after original undisplaced fracture of lateral tibial plateau. Patient had walked with no protection for his knee, without permission.

formity which cannot otherwise be corrected is the primary indication for surgical procedures. A method of conservative, nonoperative treatment is based on aspiration, manipulation, and reduction with the patient under general anesthesia, skeletal traction, and early motion and exercise.

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The case reports included in this study were taken from the records of the orthopedic service of the Evanston Hospital, with permission.

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BRINE BATH TREATMENTS FOR DECUBITUS ULCERS

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Patients with spinal cord injuries are prone to develop decubitus ulcers. These are one of the most frequent complications and are due to two factors: (a) neurogenic disturbances of metabolism in the involved tissues and (b) pressure at a bony prominence. When the patient is in the supine position pressure is directly applied against the heels, sacrum, posterior iliac region of the spine, and scapulas. When the patient is in the prone position pressure is directly applied upon the knees, anterior iliac region of the spine, and on the elbows when the upper part of the body is supported upon them. When the patient is in the side position pressure is applied directly to the lateral aspects of the distal and proximal ends of the fibula and to the areas of the greater trochanter of the femur. When he is in the sitting position in bed with the head end of the mattress raised to a 45-degree angle, a shearing force is applied over the sacral area,¹ and when he is in the sitting position in a wheel chair pressure is applied directly to the areas of the ischiatic tuberosities. If the ischiatic tuberosities have been surgically removed because of decubitus ulcers, pressure, in the sitting position, causes an ulcer in the area between the ischiatic tuberosity and the greater trochanter, described by Comarr² as the intertrochanteric area, and sometimes in the perineal area.

Pressure on the lateral and medial malleoli of the ankles from braces and tension of the soft tissues over the lateral malleolus from contractures causing inversion of the foot at the ankle must be prevented, either by conservative measures or by surgery. Pressure sores on the medial aspects of the knees due to excessive spasticity in the adductors of the thighs usually demand surgical correction by means of obturator neurectomy and adductor myotomy bilaterally. At the onset of the decubitus ulcer, the skin is only reddened, and, as has been described previously,³ blanching of the reddened skin by finger pressure indicates the absence of thrombosis in the underlying vessels and the reversibility of the local skin condition. This is achieved by relief of pressure, frequent turning, sponge rubber doughnuts, air foam mattresses, and other indicated measures.

Inflammation of the skin and phlegmon may extend to ulceration under the following conditions: (a) prolonged pressure that has occurred over the reddened area; (b) skin that has not been kept dry but has been moist from excessive sweating or from additional moisture collecting under dressings, bed-

The brine bath is part of an active program of treatment for decubitus ulcers. The brine is a solution of 5% crude rock salt and 2.5% magnesium sulfate. The temperature is about 37.8 C (100 F) at the beginning but should be adjusted to the patient's tolerance; it is allowed to decline during the 20 minutes of administration. The Hubbard tank is preferred to a tub because the patient can be more easily helped and underwater exercise can be given. The bath is part of the local treatment, which also includes other forms of physical therapy and may call for surgery; in addition the general condition of the patient needs attention. Motivation and instruction in self-care may be necessary. These recommendations are based on experience with some 1,400 patients with spinal cord injuries over a period of 12 years, with an average of 20 patients receiving brine baths each day.

clothes, or clothing; (c) general physical condition impaired due to infection of the genitourinary system, upper respiratory infections, gastrointestinal disturbances, nutritional deficits, or anemia; or (d) a disturbance of homeostasis that occurred owing to some unknown cause. Various initial skin lesions are observed—abrasions, cellulitides sometimes resembling erysipelas, bursitis, or local soft tissue gangrene—and any one of these conditions may eventuate in osteitis or osteomyelitis. Depression may accompany the physical deterioration and may even precede it, necessitating a program which includes improving the morale and motivation of the patient.

Patients with spinal cord injury are prone to develop an anemia. When a decubitus ulcer occurs the hemoglobin values range frequently from 10 to 12 Gm. per 100 cc. and not uncommonly are from 6 to 8 Gm. per 100 cc. in patients with multiple decubitus ulcers. The hematocrit value is also low. The total serum protein level is low, and the albumin-globulin ratio tends to be reversed. The blood urea nitrogen level may be high if renal damage is present. The low hemoglobin level results in poorer tissue oxygenation for purposes of tissue repair, inadequate protein levels additionally contribute to poor nutrition of the tissues, and both deficits result in weakness, decreased circulation, and stasis. Proteins are lost through the exudative fluids of the ulcer, and nitrogen balance in severe cases may be

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Read before the Section on Physical Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 26, 1958.

difficult to maintain. Proteins may also be lost through the kidneys at one time or another, and protein losses during necessitated bed rest in the presence of decubitus ulcers are increased.⁴ The absorption of necrotic substances from decubitus ulcers over prolonged periods may result in amyloidosis.⁵

Carcinoma can occur in an ulcer, and suspicion of such is an indication for surgery. One of 1,354 patients with spinal cord injuries⁶ at the Veterans Administration Hospital, Long Beach, Calif., was a veteran of World War I in whom a sacral ulcer had been present from 1940 to 1948. He developed a tumor which was successfully removed, and the ulcer was repaired. The patient is 66 years of age and is still doing well at the time of writing.

As stated previously, deep ulcers tend to invade the periosteum and bone, and an osteomyelitic process starts in an osteoporotic bone. Lowman and Roen⁷ reported favorable treatment for osteomyelitis by means of brine baths in a salt pool as early as 1924. Because Lowman's results in osteomyelitis and pyarthrosis were impressive, brine bath treatments for decubitus ulcers were started at the Veterans Administration Hospital in 1946. From 1946 to 1950 this treatment was used primarily for pre-operative preparation. Once the ulcers were filled with granulating tissue and free from necrosis, surgical repair was done. Since 1950, the brine bath technique has been improved and now a majority of ulcers heal without surgical repair.⁸ In ischial and trochanteric decubitus ulcers, recurring bursas usually necessitate surgical removal. Brine baths hasten and supplement general and local treatments and are the best means to provide a clean surgical field. There have been some 1,400 patients with spinal cord injuries in the past 12 years, and among them the number treated daily by brine baths has averaged about 20. Brine bath treatments are only one part of the over-all treatment, and each part of the over-all treatment demands meticulous attention in order that best results be achieved. The average duration of the use of the brine bath treatment for a gangrenous ulcer is about three months.

The attention given to the bacteriological flora from 1946 to 1950 was found to be of relatively minor importance, and it is known that a mixed infection existed. The recommended brine solution is bacteriocidal, yet not injurious to tissue cells. Too high a concentration is contraindicated because it is detrimental to tissue cells. On the other hand a decrease of concentration leads to a reduction or loss of bacteriocidal quality. A brine solution of 5% crude rock salt and 2.5% magnesium sulfate has been found to be most effective.

General Treatment

The general treatment of the patient consists of maintaining nutritional balance, correcting anemia and hypoproteinemia, prevention of prolonged pres-

sure by frequent turning, anabolic hormone therapy, and general hygiene. In addition, attention should be paid to proper hydration, to controlling urinary infection, and last but not least to psychological support.

Diet.—The diet must be high in protein. It should contain a variety of animal, vegetable, cereal, and yeast proteins so that the amino acids essential to tissue anabolism are present in the blood. The foods which are rich in proteins are meat, liver, fish, fowl, eggs, beans, peas, milk, whole wheat bread, and whole wheat cereals. Protein hydrolysates are not well tolerated but may cause anorexia and interference with the ingestion of the regular meals and thus may actually decrease the protein intake. The above-mentioned foods are high in iron content except for the milk which is arbitrarily limited to a glass with each meal because of a possible danger of calculus. Second helpings with each meal and multiple feedings are to be encouraged. A high amount of vitamins should be contained in the diet. Fruits and vegetables help in supplying this need. If nausea and vomiting are present, a dextrose-vitamin preparation (Trinidex), 1,000 cc. given intravenously, is administered daily, in addition to other intravenously given fluids. When intravenous injections are no longer necessary, the diet can be supplemented with multivitamin tablets, such as thiamine or vitamin B complex, as indicated.

Restoration of Normal Hemoglobin Level, Red Blood Cell Count, and Hematocrit Values.—The restoration of the hemoglobin level to normal is best achieved by transfusions of 500 cc. of blood once, twice, or three times a week, as indicated. It is generally considered that 15 Gm. of hemoglobin per 100 cc. of blood is the normal level, and it is amazing how much faster the ulcers heal when accidentally the hemoglobin level may reach 16 or 17 Gm. However, because of other factors, it is advisable to keep the hemoglobin at a level of 14.5 to 15.5 Gm. Liver is rich in iron and is beneficial when served at least once a week. When needed, 1 cc. of crude liver extract with 2 mcg. of vitamin B₁₂ is given intramuscularly every other day. Iron medicaments are given orally when the hemoglobin level has returned to nearly normal, and, although the effect is slower than with the transfusions, 5 grains of ferrous sulfate, three times daily, and other iron medicaments are usually well tolerated for moderately long periods. The results from iron medicaments are too slowly obtained for the acute early treatment. If in the presence of low serum proteins, severe edema and anasarca occur, the administration of normal human serum albumin, 50 cc. (12.5 Gm.) once or twice a day, is indicated.

Frequent Turning of the Patient.—The patient should be turned every two hours, and if sacral or trochanteric ulcers are present a Foster bed or Stryker frame is used. The turning of the Foster bed or Stryker frame should so be timed as to allow

feeding in the supine position, which should be achieved 30 minutes before meals. If only one decubitus ulcer is present a regular hospital bed may be used, care being taken that the patient never lies on the ulcer.

Hormone Injections.—In cases of anorexia and slow healing in spite of all other supportive treatments, testosterone injections of 25 or 50 mg. daily for from two to four weeks are used for their anabolic effect. A second course of this therapy may be given after a rest period of two to four weeks.

General Hygiene.—Contact sweating below the level of the lesion is present in patients with spinal cord injury and with complete lesions due to direct stimulation of the sweat glands. In addition, in patients with complete lesions, excessive sweating below the level of the lesion can occur from irritation coursing along the neurones of the rootlets and roots of the distal cord segment. Dressings may be necessary at one time or another, but as soon as the ulcer is granulating and free from slough, it should be exposed to air without dressing and protected by a bed cradle.

The patient is given a daily cleansing bath with warm water and soap as a normal skin hygiene. Alcohol rubs and talcum powder have been generally dispensed with but are occasionally used for comfort when indicated.

Bowel movements should be regulated every other day. Oral intake of psyllium hydrophilic mucilloid (Metamucil), mineral oil, and occasionally milk of magnesia, and rectal application of glycerin suppositories may be used supportively.

Exercises for the normal muscles of the upper extremities, neck and trunk, deep breathing exercises, and standing on a tilt table or standing at a standing bar are started early. These exercises improve respiration, circulation, muscle tone, and metabolism. Deconditioning or disuse atrophy is also thereby diminished or prevented.⁸

Restoration of Adequate Fluid Intake and Urinary Output.—If a patient with deep ulcers is dehydrated, it is necessary to start the daily intravenous administration of fluids with 2,000 cc. of 5% glucose solution in distilled water, 1,000 cc. of 5% glucose solution in isotonic sodium chloride, and 1,000 cc. of dextrose-vitamin preparation, until the fever subsides. As soon as the oral fluid intake becomes adequate, the intravenous administration of fluids is discontinued. An adequate oral intake is usually provided by a glass of water at hourly intervals from 7 a. m. to 7 p. m., in addition to the fluids taken with meals.

If the function of the bladder is well balanced in regard to capacity and residual, no further therapy is indicated. If imbalance, vesicoureteral reflux, or pyelonephritis are present, dependent intraurethral catheter drainage is instituted during the emer-

gency period, and, as soon as the need is passed, the reflex emptying of the bladder should be re-established, according to Bors.⁹

Antibiotics and Other General Medicaments.—In patients with high fever, antibiotics are usually used—most frequently, a form of penicillin (Crysticillin), 300,000 units, and streptomycin, 0.5 Gm., twice daily. If these do not suffice, a tetracycline, 500 mg., in 1,000 cc. of 5% solution of glucose in distilled water is given daily, intravenously, slowly. When the need for intravenous administration is past, this can be followed up with orally given tetracycline, 250 mg., four times daily. When the urinary infection no longer requires the use of antibiotics, sulfisoxazole (Gantrisin), 0.5 Gm. four times daily, may be given orally.

Motivation.—Patients who are admitted with large decubitus ulcers have usually undergone a period of inadequate care in regard to general hygiene, diet, local treatments, and genitourinary system. Concomitantly there is a mental depression. The morale and motivation improve gradually with good medical and nursing care, proper diet, good general hygiene, and attention to personal appearance, such as shaving and brushing the teeth. Bowel care, exercise, bathing, proper local ulcer care, adequate genitourinary care, and psychotherapy are also essential.

Summary.—The general treatment of the patient includes consideration of diet (proteins, calories, and vitamins); correction of anemia and hypoproteinemia (with transfusions, iron therapy, and normal human serum albumin); prevention of prolonged pressure (with Foster bed and Stryker frame); anabolic hormone therapy; general hygiene; proper hydration (intake and output); antibiotics and general medicaments; and motivation.

Local Treatment of Decubitus Ulcers

Débridement.—The local treatment of the decubitus ulcer is just as important as the general treatment of the patient. Baruch¹⁰ described the valuable effect of whirlpool or hydromassage therapy in the cleansing and healing of wounds and the promotion of the separation of dead tissue as early as 1920. Occasionally, where a large necrosis is present, careful débridement is indicated. Small eschars, if kept dry, heal without interference on removal of pressure. If infection occurs underneath the eschar, it should then be débrided.

Elimination of Direct Pressure.—The elimination of direct pressure on all ulcers is the most important factor in local treatment.

Brine Bath.—The cleansing and healing process of a gangrenous ulcer is augmented by the use of a brine bath from three to five times a week (fig. 1 and 2). The brine solution which has been used most satisfactorily at this hospital is a solution

containing 5% crude rock salt and 2.5% magnesium sulfate. This concentration provides a favorable osmotic effect and is at the same time bacteriocidal.

A Hubbard tank is preferred to a tub for tetraplegic patients because of easier access. Such a bath will require about 100 gal. of water and approxi-



Fig. 1.—Above, equipment for Hubbard tank brine bath, showing head rest and axillary support straps for tetraplegic patients. Body support in center has canvas sling adjustable to different heights. Jacuzzi whirlpool unit is in foreground. This stainless steel Hubbard tank has been in use for over 12 years, and corrosion from brine is minimal. Below, tetraplegic patient receiving brine bath treatment in Hubbard tank for sacral ulcer. Jacuzzi whirlpool unit is between lower extremities. Temperature of brine solution is checked with mercury thermometer.

mately 40 lb. of crude rock salt and 20 lb. of epsom salt. A 6-ft. tub will require about 50 gal. of water, 20 lb. of crude rock salt, and 10 lb. of epsom salt. An arm or leg bath tank may require 25 gal. of water, and a foot bath tank may require about 15 gal. The percentage of brine solution remains the same.

In the Hubbard tank and in the tub, underwater exercise can be used passively, actively, and with assistance as indicated. Because of the osteoporosis of the bones, skill, experience, and judgment must be applied in regard to passive and assistive motion. The general increase in body temperature from the warm brine solution aids the general metabolism and circulation. The force of gravity on the limbs is diminished by the floating effect of the

brine solution, muscle tension is reduced, pain and spasticity are reduced, and as a result active motion in weak muscles is enhanced. In addition, the pressure of the water upon the skin and upon the abdomen helps to improve the circulation by tending to collapse the superficial veins of the skin and by compressing the abdominal viscera, thus changing the dynamics in the vascular system.⁷ Therefore, the depth of the bath is important.

Chlorinated tap water which flows through a mixing valve at a starting temperature of 100 F (37.8 C) is used. This temperature is usually well tolerated even by patients with complete cervical spinal cord lesions and who are poikilothermic, but caution should be used in determining the patient's tolerance to heat. The bath temperature declines about 4 to 8 degrees during its 20-minute duration. This temperature is comfortable and remedial in that it provides a mild vasodilation.

Whirlpool action improves the circulation of the blood and the flow of the lymph. The Jacuzzi whirlpool is used at a distance of 12 in. from the ulcer, with a flow of 45 gal. per minute. The flow is directed up the limbs and over the ulcer. The flow can be easily adjusted from 45 gal. per minute down to zero. The distance of the machine from the ulcer can be increased as desired. The flow can be either direct or indirect against the wall of the tub or tank. The flow can also be used directly on the feet for about five minutes to improve the mobility of the soft tissues through gentle massage. This mas-

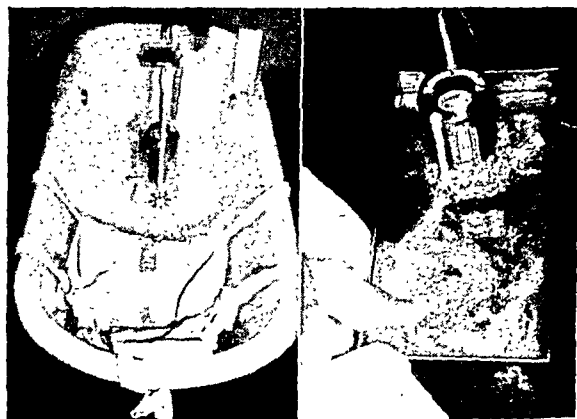


Fig. 2.—Left, equipment arrangement in former continuous-flow 6-ft. tub. Canvas sling supports upper part of body, permitting good flow of brine solution under and around buttocks, hips, and sacral areas. Right, brine foot-bath whirlpool treatment being given for decubitus ulcer of heel. This part of treatment in latter stages can be followed up at home.

saging effect is more gentle and beneficial than manual massage. However, when the tissue surrounding the ulcer is heavily scarred and adherent to the underlying bone, deep circular manual friction massage may be necessary to loosen the soft tissues from the bone. Figures 3, 4, 5, and 6 show results of the brine bath treatment.

Ultraviolet Radiation.—When the patient is removed from the bath, a suberythematous dose of cold quartz ultraviolet radiation with the Birtcher hand

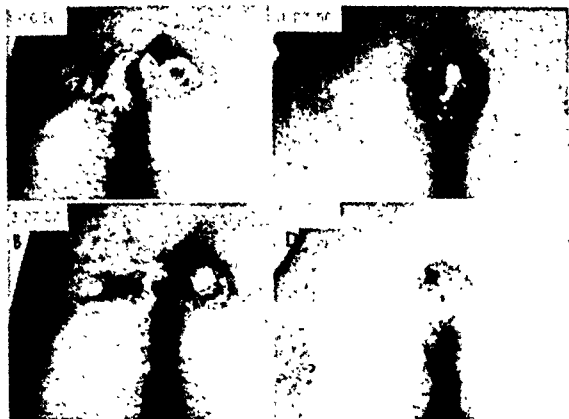


Fig. 3.—A, sacral ulcer on which surgical closure had been attempted and, B, complete healing at former tension suture buttonholes and remaining small sacral ulcer ready for buried grafts. C, sacral ulcer in paraplegic patient and, D, ulcer almost completely healed. (After 31 treatments ulcer was ready for buried grafts on 1/25/57.)

unit is applied to the base of the ulcer at a distance of 1 in., starting with 15 to 20 seconds of application and increasing the time 1 to 2 seconds each treatment up to a maximum of three to five minutes. Both the brine bath and ultraviolet radiation stim-

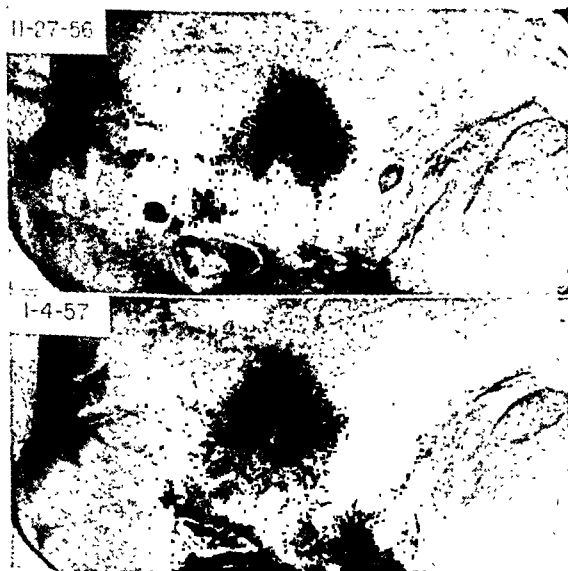


Fig. 4.—Above, multiple recurrent ulcers of buttocks in paraplegic patient with bilateral thigh amputations. Below, ulcer on right, healed after 23 treatments, and remaining ulcers ready for surgical closure.

ulate the growth of granulation tissue and possess bacteriocidal action.

Local Treatment on the Ward.—If a deep ulcer crater exists, it is filled with granulated sugar, on the patient's return to the ward. Its action is hygro-

scopic and cleanses the ulcer by osmosis. More sugar may be added two or three times a day if necessary. Occasionally, a solution of 10% Peruvian balsam in a cod-liver oil ointment base is applied to the ulcer to promote healing. If a greenish-colored discharge denotes the presence of a pyocyanous growth, boric acid powder, 2% solution, or 10% boric acid ointment may overcome this in a few days.

A superficial ulcer filled with clean granulation tissue is exposed to air and sunshine. The beneficial use of a bed cradle has been mentioned above. A protective dressing with cod-liver oil ointment can be used when the patient starts ambulating in a wheel chair.

In the early stages, when the general condition of the patient does not permit the use of a brine bath,

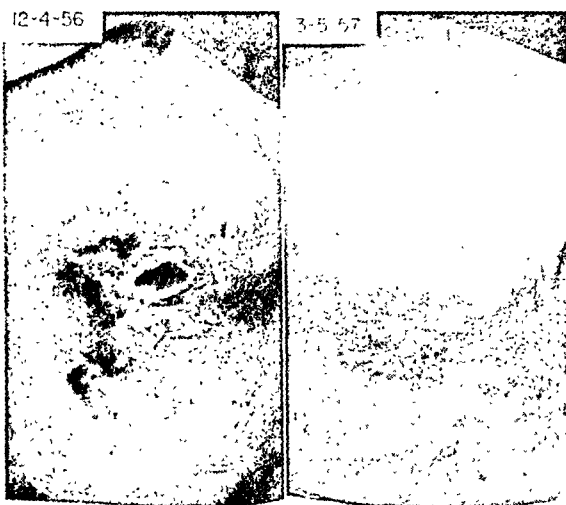


Fig. 5.—Left, sacral ulcer and discoloration with swelling of greater trochanter in patient with cervical spinal cord injury. Right, completely healed sacral area and improved condition at right trochanter.

a Dakin's pack is used locally. Dakinization by irrigating tubes is also useful in cases of deep bursas and small sinus opening.

If a cellulitis is present, elevation of the extremity and local wet packs with use of Domeboro's solution or Domeboro's solution with equal parts of 70% alcohol are beneficial. Domeboro's solution is made up with one tablet (2½ grains) in 100 cc. of distilled water, forming a solution of aluminum sulfate and calcium acetate. The U. S. P. solution is 1:10, or Burow's solution.

A bursa beneath an ulcer is usually infected and is aspirated, or incised and drained, and will require definitive operative correction. Operation will also be indicated if a sequestrum remains. If the granulation tissue becomes excessive it is burned off level with skin surface with a silver nitrate stick. A temporary measure for thin epithelialization of a sacral ulcer filled with clean granulation tissue is by means of small buried grafts of split-thickness epithelium.¹¹

When a small sinus persists, healing has been obtained by following up the above treatments with short-wave diathermy, 150 ma., for 15 minutes, with 1 to 2 in. of toweling between the drum and skin surface, staying within tolerance of the tissues to heat at all times. Microwave treatments have been used beneficially on penoscrotal fistulas, with use of director C at 2 in. for 20 minutes at 20% power, in addition to brine baths, giving five treatments weekly. If operative closure is performed, ulcer excision with bursectomy and osteotomy is the method of choice. For any patient who tends to

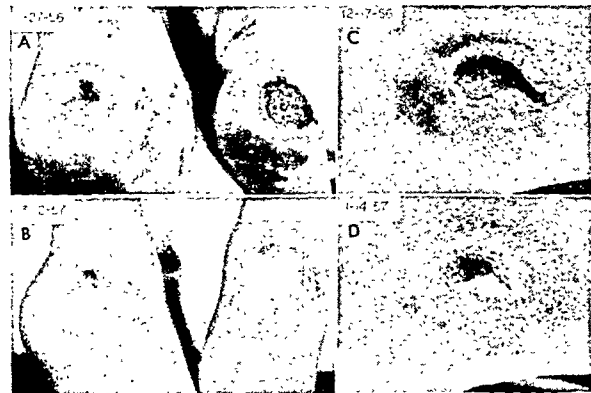


Fig. 6.—A, burns on heels of paraplegic patient from self-administered hot water bottle and, B, excellent epithelialization two and one-half months later. C, ulcer, recurrent for three years and now present for several months, over lateral aspect of external malleolus of left ankle and, D, ulcer after 10 brine foot-bath treatments ready for excision with partial resection of distal end of fibula.

develop decubitus ulcers, it must be stressed that an ounce of prevention is worth more than a pound of cure, and when healing has been obtained, the patient must be instructed to avoid pressure.

Summary.—Local treatment of the decubitus ulcer consists of débridement; elimination of direct pressure; brine bath (with controlled temperature,

chlorination, 5% crude rock salt and 2½% epsom salt [for osmotic action, bacteriocidal action, and stimulation of granulation tissue], Jacuzzi whirlpool action, and proper duration and frequency of treatment and depth of brine bath); ultraviolet radiation (with emphasis on time and distance of dosage, type of lamp, stimulation of granulation tissue, and bacteriocidal action); and local treatment on the ward (with sugar, Peruvian balsam, boric acid, exposure to air and sunshine, Dakin's solution, Domeboro's solution, silver nitrate stick, shortwave diathermy, microwave, surgical indications, and prevention).

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HEALTH GUIDANCE IN PREADOLESCENCE.—There is a greater interest in adolescence than ever before. In fact some people believe that just as the period of infancy and early childhood formerly received a concentration of attention in pediatrics and public health, so we are now moving toward the adolescent and devoting more time to his problems of growing up and seeking independence in our ever more complex society. In adolescence psychologic problems take on greater significance. As teen-agers are apt to look elsewhere than to their own parents for guidance, the schools through counselors and others often have an opportunity to be helpful to them. Many parents are unprepared to cope with the various phases of adolescent development. For many years health workers have emphasized anticipatory guidance for parents of preschool children, but only recently has it been suggested that similar guidance might be offered to parents of pre-adolescent children. . . . Problems of adolescence may well be the major challenge of our generation, just as infant mortality was for the previous one.—A. J. Lesser, M.D., *Changing Emphases in School Health Programs, Children*, January-February, 1958.

GRANULAR URETHRITIS IN WOMEN

SURVEY OF THREE HUNDRED PATIENTS TREATED BY CYSTOSCOPIC FULGURATION

Howard Z. Fretz, M.D., Wharton, Texas

Granular urethritis is a common pathological entity in women which is frequently overlooked and undertreated in the general practice of medicine. It is a chronic infection that smolders in the urethra for months or years with periodic episodes of acute symptoms that too often are labeled "cystitis" and treated solely by oral medication.

Certain characteristics of this condition may be highly misleading to those practitioners not fully aware of the diagnostic and therapeutic pitfalls. Pyuria is characteristically absent in the catheterized specimen unless, of course, there is an associated cystitis or upper urinary tract infection. The nonurinary complaints may overshadow the urinary symptoms. A constant sacral ache may be attributed wrongly to arthritis or chronic back strain, suprapubic discomfort to the uterus, lower quadrant pain to the ovary or appendix, and dyspareunia to some gynecologic cause. Because so many of these women become nervous and easily fatigued there is an inclination to consider them psychoneurotic. Under the influence of antibacterial drugs the urinary symptoms frequently will subside only to reappear weeks or months later.

When chronic urethritis reaches the stage where granulations are numerous, I have seen no treatment but fulguration effect a cure. During my earlier years of urologic practice I relied mainly on urethral dilations and instillations, and it was gratifying to note that the majority of the women so treated obtained symptomatic relief, although the granulation in the urethra persisted. This accounts for the relatively small number of cases reported in the five-to-eight-year postoperative period. Disillusionment resulted when these patients returned periodically with recurrence of their symptoms. Observation has convinced me that vaginitis and cervicitis play an important role in the etiology and pathogenesis of urethritis, and substantiating data will be presented.

Report of Cases

This series is composed of 300 private patients who had granular urethritis uncomplicated by such conditions as Hunner's ulcer, vesical neck contraction, or neurogenic bladder. The age groups were as follows: 7 patients, 11-19 years of age; 58, 20-29; 90, 30-39; 61, 40-49; 55, 50-59; 26, 60-69; and 3, 70-75.

Granular urethritis is a chronic infection that smolders in the urethra for months or years and causes a variety of misleading nonurinary symptoms. Backache, the most frequent of these, was present in 261 (87%) of 300 patients and was located most often in the sacral region with or without radiation into the thighs. Pus was absent from urine specimens obtained by catheter unless infection also existed in the bladder or upper urinary tract. The treatment by fulguration here described was carried out in the hospital with the patient under anesthesia induced by thiopental sodium. Correct postoperative care is essential, and the patient should be observed for at least three months. In a series of 300 women so treated 263 returned for final evaluation three or four months after fulguration, and all except 35 reported complete relief of their urinary symptoms. Among 185 who were followed for longer periods, more than half had no recurrences.

The postoperative interval varied as follows: from 4 to 11 months, 58 patients; one year, 129; two years, 47; three years, 32; four years, 20; five years, 7; six years, 3; and seven-eight years, 4. The urinary symptoms in order of frequency were diurnal frequency, 201 patients; discomfort on urination, 123; nocturia, 105; urgency, 90; feeling of incomplete emptying, 57; slow stream or straining, 39; constant desire to void, 29; constant urethral discomfort, 3; and enuresis, 2. Diurnal frequency was often more pronounced in the morning. The women with a feeling of incomplete emptying had no residual urine and had the desire to void again a short time after bladder evacuation. The large majority of those patients who complained of a slow stream had a normal urethral caliber, which indicates that granulations, villi, and polypoid masses may interfere with free urinary flow.

Table 1 summarizes the nonurinary symptoms. Backache occurred most frequently (87%) and was located most often in the sacral region with or without radiation into the thighs. Twenty-seven patients had pain in the flank area and the costovertebral angle, 19 of whom had normal pyelograms. Of the remaining eight, there was marked

renal ptosis without hydronephrosis in three, ptosis with mild hydronephrosis in two, and reduplication of the pelves and ureters in three. All were relieved by fulguration except one who had ptosis with mild hydronephrosis and who obtained a good result after nephropexy and ureterolysis. The results of 65 upper urinary tract studies were as follows: normal, 45 patients; right ptosis (no hydronephrosis), 9; right ptosis (mild hydronephrosis), 5; reduplication of pelves and ureters, 5; and mild ureteropelvic junction obstruction, 1.

Seventy-one per cent of the patients complained of discomfort or pain in the lower abdomen, frequently accompanied by mild abdominal distention. Many patients described a feeling of fullness, aching, pressure, pelvic heaviness, or a sensation as though they were about to menstruate. Dyspareunia occurred in 22% and was readily accounted for by a tender urethra which rebelled at any pressure along the anterior vaginal wall. The aver-

TABLE 1.—Summary of Nonurinary Symptoms

Symptoms	No.
Backache	261
Sacral	176
Hips (bilateral)	22
Hip (right)	15
Hip (left)	7
Costovertebral angle and flank (right)	17
Costovertebral angle and flank (left)	10
Lumbar (bilateral)	9
Coccygeal	5
Abdominal discomfort	213
Suprapubic	156
Lower abdomen (right)	22
Lower abdomen (left)	13
Groin (bilateral)	11
Groin (right)	7
Groin (left)	4
Dyspareunia	67
Lower extremity discomfort	62
Thighs	55
Calves	8
Fever	31

age woman rarely volunteered this complaint, and it was usually elicited by direct questioning. The site of lower extremity discomfort, present in 20% of the patients, was most often the thighs, especially on the posterior aspect and frequently as an extension of sacral ache. Eight (2.6%) had cramping in the calf muscles, particularly at night. Low-grade fever occurred in 10% and had been present for weeks or months. Fatigue and nervousness was common, although no exact statistics are available.

Examination

Cystoscopy was done routinely with the McCarthy panendoscope, because superior visualization of the urethra is obtained through its Foroblique lens, affording a view of areas that otherwise would be missed by the right angle lens. The bladder and its trigone were carefully inspected and the bladder capacity determined. Male sounds were gently passed to determine the caliber of the urethra and

the external urethral meatus. The anterior vaginal wall was palpated to detect the presence of tenderness, induration, or mass. Bimanual pelvic examination was done and the vagina and cervix were carefully examined. If there was evidence of vaginitis or abnormal discharge, the appropriate laboratory tests were done to determine the cause. If the cervix appeared diseased, consultation was obtained with the gynecologist.

The cystoscopic findings were as follows: 139 patients had normal bladders; 137 had chronic trigonitis; 32, mild trigonitis; 79, moderate trigonitis; 26, severe trigonitis; and 24, acute cystitis. All 300 patients had granulation of the urethra; 51 had polyps; 55, meatus stricture; 24, urethral narrowing; and 7, caruncle. Note that at the time of the initial examination 46% of the patients had normal bladder and trigone.

The urine was pus-free in all except the 24 women with cystitis and a few with severe trigonitis. Granulation tissue was most prominent in the proximal one-third to two-thirds of the urethra, and involved the anterior, posterior, and lateral walls. Numerous villi and polypoid masses were commonly associated and probably represented an advanced stage of the inflammatory process. Stricture of the external urethral meatus was found in 18%, the majority of which varied from 16 to 23 F. Urethral narrowing was observed in 8%, and varied from 18 to 25 F.

Vaginitis was found in 72 patients (24%) at the time of the initial examination. There were four types: menopausal, 25; monilia, 21; nonspecific, 15; and trichomonas, 11. Chronic cervicitis was present in 38 (13%), and cystocele in 35 (12%).

Treatment

All forms of vaginitis were cured before proceeding with the fulguration. The gynecologist cauterized the cervix when indicated; this was done in 24 patients before and in 14 at the time of the fulguration. All women with cystoceles who had residual urine or stress incontinence were advised to have reparative surgery. Ten of these repairs were done concomitantly with the urethral fulguration. If the bladder capacity was reduced, gravity irrigations were used to improve it. If the urethra readily accommodated sounds to 27 F. and the bladder and trigone were normal, the patient was given sulfisoxazole (Gantrisin) tablets for one week prior to fulguration. If urethral resistance was encountered, weekly dilatations were performed until sounds to 28 F. could easily be passed. Meatotomies were done with patients under local anesthesia when indicated. If there was an associated cystitis or severe trigonitis, sulfisoxazole was given for two weeks and cystoscopy repeated. The anatomy of the female perineum was carefully explained to each patient with use of illustrations and simple sketches. Emphasis was placed on the

proper use of toilet tissue after urination and defecation, as well as the correct method of douching as advocated by Biskind.¹

All fulgurations were done in the hospital with patients under thiopental (Pentothal) sodium anesthesia. Intravenous urograms were previously ordered when indicated. The urethra was first dilated to 32 F., and meatotomy was done if the urethral meatus offered resistance or became blanched during passage of the sounds. A Bugbee electrode was used through the 20 F. sheath of the panendoscope, activated by the Wappler surgical unit set at 30. All granulations and polyps were thoroughly fulgurated with use of short bursts of current while the panendoscope was moved in the direction of the bladder. As the bladder became more distended with water, the walls of the more distal portions of the urethra separated to a greater degree, facilitating the procedure in this region. Urethral caruncles were completely excised. The patient was returned to her room without a catheter, except when cystocele repair was also performed, and she was ordinarily dismissed the next morning and allowed to resume her usual duties. Coitus was advised against for at least four weeks and carbonated and alcoholic drinks and highly seasoned foods were prohibited for three months. Four tablets daily of sulfisoxazole with 50 mg. of phenylazodiamino-pyridine hydrochloride (Azo Gantrisin) were prescribed for two weeks.

The first follow-up visit occurred five weeks after dismissal, at which time 1 oz. of nitrofurazone (Furacin) solution was instilled into the bladder and sounds to 27 F. were passed. If urethral resistance was encountered, additional dilatations were performed at weekly intervals; otherwise the patient was next seen two months later for cystoscopic examination. If the urethra easily admitted a 29 F. sound and the trigone appeared normal, the patient was discharged; otherwise additional visits were scheduled. The essential facts of perineal care were reviewed, and the patient was advised to seek prompt treatment of any abnormal vaginal discharge. Those who had an asymptomatic cystocele were told what symptoms to expect, such as stress incontinence, should this condition become more pronounced in the future.

Complications.—Complications were few and of mild degree. In the early postoperative period there was either no dysuria or, at most, minimal burning on urination. Between the second and third weeks mild to moderate discomfort was not uncommon, but, by the end of five weeks, most patients voided with comfort. Intermittent terminal hematuria occasionally appeared during the early weeks, but only two patients had episodes of total gross hematuria. One cleared spontaneously and the other stopped promptly after catheter drainage for 24 hours. Five women had acute retention while in the

hospital but voided freely after removal of the Foley catheter the next morning. No patients developed incontinence or urinary fistulas. There were no urethral strictures or bladder neck contractures as a result of the fulguration, but 26 patients noted some slowing of the urinary stream between the first and the third months. This symptom disappeared after several additional dilatations.

Results.—Three to four months after fulguration 263 patients returned for final evaluation and all except 35 reported complete relief of their urinary symptoms. Seventeen became asymptomatic after further treatment: Two underwent cystocele repair, one had correction of marked uterine retroversion, two were treated for monilial vaginitis, three for menopausal vaginitis, two for nonspecific vaginitis, and seven complained of slowness of the urinary stream which was relieved by additional urethral dilatations. Fifteen continued to have nocturia one to three times, two had diurnal frequency, and one had mild urgency. Among this group two had cystocele and three had anxiety neuroses. Thus a total

TABLE 2.—Appearance of Trigone After Treatment in 111 Patients with Trigonitis

Degree of Previous Infection	No.
Normal trigone	84
Mild	29
Moderate	45
Severe	10
Improved appearance	24
Mild	0
Moderate	12
Severe	12
Not improved	3
Mild	0
Moderate	0
Severe	3

of 18 (6%) were improved but continued to have mild urinary symptoms. Lower abdominal symptoms had disappeared in all but 10 patients, of whom 2 had diverticulitis of the colon, 3 had spastic colitis, 2 had endometriosis, 1 had a periumbilical hernia, 1 had a marked cystocele which was later successfully repaired, and 1 had uterine congestion with tender uterosacral ligaments. In all but seven backache was relieved. Three had severe osteoarthritis, one had a chronic infection of the cervix which was relieved by cauterization, and in three the cause was not clear but chronic back strain was suspected. Those women with dyspareunia had established normal conjugal relationships by the end of three months. Two patients obtained complete comfort only after the gynecologist had corrected uterine retroversion with a pessary. In none had fever persisted. Endoscopic examination revealed absence of the previous urethral infection; the mucous membrane appeared smooth and healthy looking, and previous urethral tenderness had disappeared. In those patients with an associated vaginitis the urethra exhibited various degrees of inflammation which subsequently subsided.

Table 2 compares the appearance of the trigone in 111 patients who had previously had various degrees of trigonitis.

Follow-up Studies

Letters were sent to all of the 300 patients requesting information as to their status since their final visit. Replies were received from 185, or 62%, and have been divided into groups based on the number of recurrences of symptoms. Group 1 consists of 101 patients (54%) who reported no recurrence of their previous symptoms. The post-fulguration intervals are as follows: 23 patients, 6-11 months; 54, one year; 10, two years; 9, three years; 3, four years; and 2, five-six years. Fifteen of these women returned for a routine examination up to five years later, and no recurrence of granulation was observed.

In group 2 were placed the 48 patients (26%) who had one brief mild recurrence of urinary symptoms. Also included are those patients who later developed symptoms from their cystocele, such as nocturia and stress incontinence. The post-fulguration intervals were: 4 patients, 6-12 months; 18 patients, one year; 7, two years; 10, three years; 5, four years; 3, five years; and 1, seven years. Of these patients, 42 returned for reexamination shortly after recurrence of symptoms. It was found that 11 had monilial vaginitis; 10, menopausal vaginitis; 10, cystocele; 7, cervicitis; 2, nonspecific vaginitis; and 2, no gynecologic disease. One had nervous diuresis and the other had symptoms related to her period. Five of the seven with cervicitis required cauterization of the cervix. In the 10 patients with cystocele the findings were otherwise normal; 5 were relieved after repair while the remaining 5 have not as yet consented to surgery. In 30 the urethral mucosa was inflamed, but there was no recurrence of granulation. None has had any trouble since correction of the associated gynecologic disease.

Group 3 includes 26 women (15%) who have had two recurrences of urinary symptoms or who have had one episode of acute cystitis. Their post-fulguration intervals were as follows: 11 patients, one year; 6 patients, two years; 3, three years; 5, four years; and 1, five years. Seventeen of the 26 returned for examination at which it was found that 6 had menopausal vaginitis; 4 had trichomonas vaginitis; 4, nonspecific vaginitis; 2, monilial vaginitis; 2, cervicitis; 4, cystocele; 1 was pregnant; and 1, post partum. In seven women acute cystitis was present, while the remainder had varying degrees of urethritis.

Group 4 consists of 10 patients (5%) who have had more than two recurrences of urinary symptoms or who have had more than one episode of acute cystitis. The post-fulguration intervals were as follows: one patient, one year; five, two years; two, three years; and two, five-six years. Only five

women returned for reexamination. Two had menopausal vaginitis and have had no further trouble since this has been treated. In two no gynecologic disease was found, and in one there was some degree of urethral narrowing.

Comment

In addition to various urinary symptoms, the majority of these women had discomfort in the regions of the back, hips, legs, and lower abdomen, which Powell² explains as due to lymphatic stasis in the floor of the pelvis secondary to the inflammatory process in the urethra. This results in spasm of the pelvic muscles, particularly the piriformis, which originates between the first to fourth anterior sacral foramina and may cause referred pain in the areas supplied by the sacral plexus. This muscle passes from the pelvis through the greater sciatic foramen and may, when spastic, compress the sciatic and posterior femoral cutaneous nerves as they pass between it and the superior gemellus muscle. Occasionally the common peroneal nerve will branch prematurely from the posterior tibial nerve and actually pierce the piriformis. The superior and inferior gemelli, the obturator internus, and the piriformis all take origin from within the pelvis, attach to the greater trochanter of the femur, and can readily account for pain in the hip regions. Levator ani and coccygeal muscle spasm may cause discomfort in the pelvic and coccygeal areas. Powell² reports a hastening of symptomatic relief by digital massage of the piriformis muscle. There were 25 patients with no renal disease who had pain in the renal area, probably as a result of lumbar muscle spasm. It is interesting that six of these, or 24%, had a strictured external urethral meatus.

The fact that the nonurinary symptoms may simulate other conditions is illustrated in the cases of four women in this series who had surgical procedures which failed to relieve their lower abdominal discomfort. One patient, aged 41, had her uterus, ovaries, and ovarian tubes removed and a subsequent appendectomy; another, aged 32, two years previously had had her right ovarian tube and ovary removed; another, aged 36, continued to suffer for eight years after a hysterectomy; while another, aged 33, had had her uterus removed six months before. Many of the so-called psychoneurotic patients became less tense, slept better, and had more energy. The duration of symptoms varied from a few months to many years. One patient, aged 42, wrote that for the past 4 years she has enjoyed more comfort than she had had for the previous 20; another, aged 60, reported that she has been free of symptoms for the past year after having had trouble for 20 years. A low-grade fever occurred in 10% of this series; therefore, chronic urethritis should be considered in any differential diagnosis of unexplained mild fever. Strictures of

the external urethral meatus were common and were seen in 55 women, all of whom underwent meatotomy. Twenty-four had some degree of urethral narrowing, so that in a total of 79 women (26%) there was an obstructive factor.

Associated gynecologic disease was frequent, and I have been fortunate in having the services of a gynecologist readily available in a clinic group. The vaginal secretions constantly bathe the external meatus and are frequently a focus of infection; the intimacy of the lymphatic drainage of the cervix and lower urinary tract is well known. Fifty-one patients (17%) had to have cauterization of the cervix; in 24 it was done before, in 14 at the time of, and in 13 after fulguration. Gross pus was often obtained from the deep glands of the cervix during this procedure. Cervicitis and various forms of vaginitis were associated with most of the recurrences of urinary symptoms in the follow-up period. The treatment of menopausal vaginitis is recommended because of the secondary lowering of resistance to infection in the vagina and urethra. The condition responded to daily instillations of estrogenic cream for at least four weeks, along with the oral intake of small doses of estrogen. The additional use of Furestrol urethral suppositories (nitrofurazone 0.2%, dipiperodon hydrochloride 2%, and diethylstilbestrol 0.0077% in water-dispersible base) would appear to have been effective, although this preparation was of too recent origin to have been given an adequate trial in this series. It is important that the patient be made aware of the possibility of future recurrences of this condition.

There was no increase in morbidity among the 24 patients who underwent urethral fulguration and cervical cauterization or cystocele repair at the same time. Chronic trigonitis disappeared or improved in the great majority of patients in whom it was present at the time of the initial examination, which would indicate that it is an extension of the infection in the posterior urethra. It is significant that, although urethral dilatations alone

are beneficial, 10 patients in this series had had an adequate number of such treatments elsewhere with little or no improvement. Also, some women tolerate repeated dilatations poorly and soon discontinue their visits when faced with a protracted period of this type of therapy.

It is essential that all women who have had urethral fulguration be followed over at least a three-month period, and none should be dismissed until the urethra easily admits a 29 F. sound. Each patient should thoroughly understand the proper hygiene of the perineal area.

Summary

This report analyzes a series of 300 women with granular urethritis who were treated by cystoscopic fulguration of the urethra. The pathological changes were the result of chronic low-grade infection, best demonstrated by employing the Foroblique lens on cystoscopic examination. The patients ranged in age from 11 to 75 years. Pyuria was absent in those patients who did not have an associated cystitis. The nonurinary symptoms, of which backache (87%) and lower abdominal discomfort (71%) were most common, may simulate other pathological conditions. Drugs and urethral dilatations, while helpful, were not curative. Vaginitis was seen in 24% and chronic cervicitis in 12% at the time of the initial examination. Recurrences of the urinary symptoms in the follow-up period were most often associated with gynecologic disease. A follow-up period of six months to seven years was possible in 185 patients in this series, of whom 54% had had no recurrences, while 26% had had one mild episode of urinary symptoms.

105 Hawes St.

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CANCER OF THE LUNG.—Smoking is a complex social phenomenon which in the mid-twentieth century has grown to such proportions as to constitute a threat to the public health quite beyond our past expectancy. It is a formidable problem, though other and more recalcitrant if less widespread forms of drug addiction have been successfully tackled and overcome. Merely to sound the alarm may stimulate some to a successful effort to abandon smoking, but with many it only increases their anxiety and to these we should try to offer more practical help. There is no simple remedy, but explanation, education, group discussion, hypnosis, simple relaxation techniques and alternative forms of mouth satisfaction such as sucking, chewing or biting are helpful, and along with any other possibility which appears promising, ought to be energetically tested and explored. Cancer of the lung should now be regarded as largely preventable and even if prevention is difficult the position is more hopeful than with most malignant growths.—Smoking, *Tubercle*, December, 1958.

ECHINOCOCCUS IN MAN AND DOG IN THE SAME HOUSEHOLD IN NEW YORK CITY

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and

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Approximately 40 autochthonous *Echinococcus* infections in man have been reported in the United States.¹ We know of several unreported infections, and recent studies in Mississippi indicate that this parasite is more common than the literature suggests. Records of the New York City Health Department reveal 49 reported *Echinococcus* infections between 1948 and 1957, the majority among immigrants and several among native Americans who traveled abroad in *Echinococcus* endemic areas. We found no evidence of a native New York City resident contracting the infection in the city.

Swartzwelder,^{1b} in a review of all cases of *Echinococcus* disease in Louisiana, stated that 10 of the 15 recorded cases occurred in native-born Americans. Unfortunately, he did not give data on residence abroad of this group. He emphasized that infection of the dog with the adult *E. granulosus* is rare in Louisiana and cited the helminthological study of Hinman and Baker,² in which no infection with the adult *Echinococcus* was found in an examination of 1,315 local dogs. Edney³ and Franklin and Ward⁴ have reported canine infections with *E. granulosus* in southern United States. The two *Echinococcus*-infected patients here reported reside in New York City, visited endemic centers of the disease, and owned a dog infected with the adult *E. granulosus*.

Report of Cases

CASE 1.—A 42-year-old American housewife of Greek origin consulted her physician on March 4, 1957, for recurrent pain of two weeks' duration in the right upper quadrant. The patient was born and spent her youth in a small town in Greece where dogs and sheep were numerous, and her family owned a dog from time to time. Since her arrival in New York in 1934, the patient had made three visits to Greece, the first in 1938, for six months, and the other two in 1950 and 1955, for two months each. She denied having had any contact with dogs in New York, except for a puppy which the family had acquired during their last visit to Greece in 1955.

A presumptive diagnosis of hydatid cyst of the liver was made on the basis of (1) a history of residence in an *Echinococcus* endemic area, (2) a history of *Echinococcus* disease in a brother, (3) the finding of a palpable, somewhat tender mass in the right upper quadrant, and (4) roentgenographic evidence of a localized area of increased, noncalcific density in the right upper quadrant. The complement-fixation test result was negative on one occasion and doubtful on another.

Recurrent spells of abdominal pain in a woman, on the basis of history, physical examination, laboratory tests, and roentgenography, led to a diagnosis of Echinococcus cyst of the liver. This was confirmed at laparotomy, when the intact cyst was removed. Several months later a second cyst had to be removed. In a second patient, a boy of 16, severe symptoms after a sharp blow on the abdomen were found to have been caused by the rupture of an Echinococcus cyst of the liver. Both patients had visited in Greece, where the parasite is highly endemic, but they had also been in contact with a dog that had been imported from Greece and was found to be infected. Of the laboratory tests used, the eosinophil count was the least useful, since it gave normal figures in both cases. The intradermal Casoni test was more reliable than the complement-fixation test.

The hemagglutination test gave a positive result in a serum dilution of 1:10,240. The Casoni skin test gave a negative result when read after 30 minutes. There was no eosinophilia.

The patient was operated on March 15, 1957, and a cyst, 9 cm. in diameter, was removed intact from the liver without seepage or spillage. Its inner wall was translucent, extremely friable, and 0.5 cm. in thickness. On section, the cyst contained cloudy fluid with a whitish, sandy sediment which on microscopic examination revealed innumerable scolices and hooklets of *E. granulosus*.

Several months later, three weeks after her son's operation (case 2), the patient again noted recurrent pains in her right upper quadrant which radiated to her right shoulder and back. There was no nausea or vomiting. Her abdomen was slightly spastic in the right upper quadrant. The liver edge was not palpable. Casoni intradermal test at this time gave a delayed positive reaction. The white-blood cell count was 6,800 per cubic millimeter, with 2% eosinophils. The complement-fixation test finding was positive (3+), and the hemagglutination test was positive in a serum dilution of 1:160. X-ray examination revealed a cyst in the liver which was not demonstrable in previous films. Thirteen and one-half months after the removal of her first *Echinococcus* cyst a second cyst, 15 cm. in diameter, was removed from the substance of the liver. Her recovery from the operation was uneventful.

Epidemiologic studies undertaken at the request of the surgeon disclosed that the patient owned a 2-year-old German shepherd dog which was ac-

From the Bureau of Preventable Diseases, New York City Department of Health, and Columbia University College of Physicians and Surgeons.

quired in Salonica, Greece, in July, 1955, when it was 4 weeks old. Inquiry of the owner of the dog as to its dietary regimen prior to its importation revealed that the dog ate "everything, including scraps of meat." The animal remained with the family except for a period of 45 days, during which time it was confined in a New York City veterinary hospital for partial paralysis of its posterior limbs. The dog received the usual vaccinations for rabies and distemper, had been dewormed twice presumably for roundworms, and allegedly has been in good health. We examined two stool specimens of the dog, and both specimens contained *Taenia* eggs, species unidentified.

As the dog was procured from a highly endemic *Echinococcus* area, the family was cautioned that the *Taenia* eggs found in the dog's excreta might be those of *E. granulosus*. They were urged to take the dog to their private veterinarian for tapeworm therapy and were instructed to alert him of our findings. The dog was dewormed, and specimens submitted to us after the vermifuge were identified

part of the abdomen gave normal findings. Hemograms were within normal range. There was no eosinophilia. Only one household contact (case 2) gave positive intradermal reaction with two *Echinococcus* antigens.

CASE 2.—The 16-year-old younger son of the owner (case 1) of the infected dog had a hemagglutination test positive in a dilution of 1:10,240. However, findings on physical examination, roentgenogram of chest and right upper part of the abdomen, and *Echinococcus* complement-fixation test were all negative. His white blood cell count was 9,000 per cubic millimeter, with 4% eosinophils. The boy denied contact with dogs during his two months' stay in Greece in 1950 and 1955 but had very close contact with the family's infected dog for almost two years. His family physician was apprised of our findings and their possible implications.

Eight months after his examination, he received a sharp blow on his abdomen from the elbow of an opponent during a basketball game. He immediately experienced a diffuse abdominal pain which radiated to his right shoulder. He felt faint, perspired freely, and vomited. Within four hours his abdomen became rigid. His hemogram showed the red blood cell count to be 5,200,000 per cubic millimeter, hemoglobin level 105%, and white blood cell count 11,100 per cubic millimeter, with 74% neutrophils, 1% eosinophils, 23%

Epidemiological and Laboratory Data on Human Contacts with Infected Dog

Case, Age, No.	Yr.	Sex	Birthplace	Travel History	Dog Contact in Endemic Area	Contact with Infected Dog	Skin Test (Casoni)	<i>Echinococcus</i> Complement-Fixation	White Blood Cell Count, per Cu. Mm.	Eosinophils, %	X-ray of Chest and Abdomen
1	42	F	Greece	New York 1934 Greece 1938, 6 mo.; 1950, 2 mo.; 1955, 2 mo.	Yes	Casual	Negative immediately; positive delayed	Negative; doubtful; positive	...	3	Mass in right upper quadrant; cysts removed from liver 4/15/57 and 5/2/58
2	16	M	New York City	Greece 1950, 2 mo.; 1955, 2 mo.	No	Intimate	Positive immediately	Negative; positive	9,000	4; 6; 1	Negative; cyst removed adherent to liver on 3/27/58
3-12	8-50	6M; 4F	5 foreign; 5 New York City	8 visited Greece	3 yes; 6 no	5 intimate; 5 casual	Negative	7 negative	7,600-11,000	0-3	5 negative; 5 not done

as adult *E. granulosus*. To be safe, the dog was sacrificed but no additional tapeworms were found on postmortem examination.

After the discovery of infection in the dog, epidemiologic studies were extended to known close contacts of the dog, including members of the household, relatives, and neighbors. Eleven persons with contact were interviewed and examined; five of them were household members, and the remainder were neighbors and relatives.

The following epidemiologic data were secured from all contacts: place of birth, travel in endemic areas, contact with dogs in endemic areas, and contact with the infected dog in New York. A Casoni skin test with use of two human cyst fluid antigens of proved potency, complement-fixation test, and x-ray of the chest and abdomen were also done (see table).

Eight of the 11 contacts of the infected dog who were tested gave a negative reaction, and one (case 1) gave successively negative, 2+, and 3+ reactions with the *Echinococcus* complement-fixation test. Seven of the 11 contacts who had roentgenographic examinations of the chest and upper

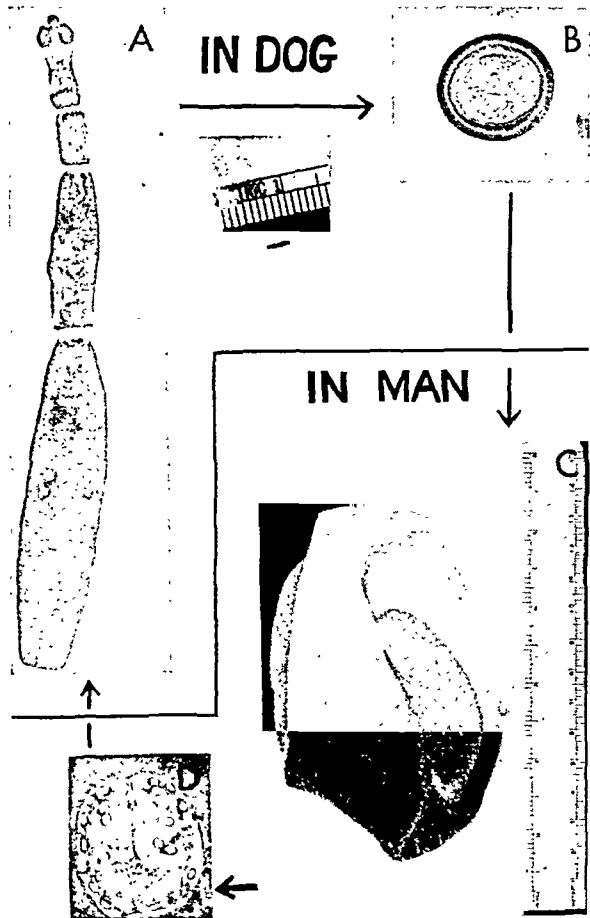
lymphocytes, and 2% monocytes. At operation, a ruptured *Echinococcus* cyst the size of a small grapefruit, adherent to the liver and gallbladder, was found. The small intestine was inflamed. The cyst was removed and found to contain *Echinococcus scolices*. The patient's recovery was uneventful. Two weeks after operation his complement-fixation test gave positive results.

Comment

Of primary interest in this study is the source of the infections of the two patients. Were they acquired in Greece, where the parasite is highly endemic, during the childhood of the patient in case 1; during several visits there later; or in the United States from either their own infected dog or other canine sources? The *Echinococcus* cysts removed from the patients were approximately 9 to 15 cm. in diameter. The rate of growth of cysts is extremely variable and depends on their site, nutrition, and species of host. In vascular organs, such as the lungs and spleen, growth is often rapid. Edwards noted that a pulmonary cyst grew 2 to 3 in. in diameter in one year. Variations in rate of growth and sudden increases in size have been noted. In the liver of the pig the cyst reaches

a diameter of 2 mm. in two months.⁵ An increase of 1 cm. in diameter per year is an average growth rate for hepatic cysts in adult human hosts. Growth rates of 2 to 2.5 cm. in diameter per year have been reported from young children. Extremely slow growth of cysts has been reported, several of which reached a diameter of 2 to 6 cm. in 11 to 23 years. The life cycle of *E. granulosus* is shown in the figure.

From the foregoing it would appear that the cysts of the two patients could have been from 2 to 15 years old. The patients could, therefore, have acquired the infection from their own



Life cycle of *E. granulosus* (A and B refer to part of cycle found in dog and C and D to that found in man): A, adult *E. granulosus* removed from dog. B, *E. granulosus* egg from dog. This is infectious for man and develops into *Echinococcus* cyst. C, *Echinococcus* cyst from liver of patient (case 1), opened to show interior. D, scolex from cyst which, when eaten by dog, becomes adult tapeworm.

dog or during one of their visits to Greece in 1950 or 1955. The patient in case 1 harbored two cysts approximately of equal size, suggesting that they were possibly acquired at the same time. It seems somewhat unlikely that hepatic cysts of the size harbored by the patients were due to infection from association with their parasitized puppy dur-

ing the past two years. On the other hand, they both admitted close association with this dog. The third possibility is that the patients acquired the infection in the United States, specifically, New York City. However, all of the 49 infections reported to the New York City Health Department during the past 10 years were in immigrants from endemic areas or Americans who had visited endemic areas. Considering all the evidence available, it is impossible to determine the time and place of infection of the two patients.

The result of the complement-fixation test of the patient in case 1 was negative and "doubtful positive" before the surgical removal of her first cyst and positive 13 months later at the time of the removal of her second cyst. Her Casoni intradermal test prior to her second operation, read at 30 minutes, was negative, but 24 hours later it showed a "delayed positive" reaction. The Casoni skin test of the patient in case 2 one year and also six weeks prior to operation gave an immediate reaction. His complement-fixation test finding was negative one year before operation and strongly positive two weeks after operation, which may be related to the cyst's growth and rupture and the patient's sensitization. It is generally agreed that the intradermal test is a more reliable diagnostic aid than the complement-fixation test. The eosinophil counts of both patients were within normal limits.

Summary

Echinococcus cysts were removed surgically from a woman and her son residing in New York City in whose household lived a dog infected with the adult *Echinococcus granulosus*. The dog had been imported from Greece.

600 W. 168th St. (32) (Dr. Brown).

Dr. E. Grivelis, St. John's Episcopal Hospital, referred the patient and cooperated in the epidemiologic study. Drs. L. M. Fox and E. Khayat performed pathological studies. Hemagglutination tests were done by Mr. William F. Hutchison, University of Mississippi. Mrs. M. V. Forbes LaRiviere provided laboratory assistance. Dr. K. L. Hussey supplied the photographs.

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CLINICAL NOTES

SIMPLE REGIONAL NERVE BLOCK FOR SURGERY OF THE HAND AND FOREARM

Preston J. Burnham, M.D., Salt Lake City

Injuries to the hand and forearm consistently hold a high place in the incidence of bodily trauma. They often need to be repaired immediately. Unfortunately, the stomach is often full of food and drink or there are multiple injuries which make the use of a general anesthetic a dangerous procedure.

The supraclavicular brachial plexus block has often been employed. However, this block has many disadvantages: First, it is accomplished by pneumothorax and/or phrenic nerve paralysis in 2 to 25% of cases reported.¹ Such a complication might well prove overwhelming to the patient with a severe chest injury. Second, the block is effective in only 68 to 90% of cases.² Consequently, general anesthesia is often reluctantly used to augment this block.

The local use of anesthetic agents throughout the field of trauma is to be decried for many reasons, among which are the spreading of infection in an open wound, short duration, use of a toxic amount of anesthetic agent, and, perhaps foremost, the usual uncertainty of results.

There would seem to be a need, therefore, for a type of anesthesia in the arm that would have the following advantages: certainty of result; ease of administration by any physician; minimal danger of systemic toxicity and even of anaphylactic reaction if sensitivity is present; adequacy for major surgical procedures on the hand and forearm, with minor procedures safely performed under regional digital³ or regional wrist⁴ blocks; without danger in the presence of the usual full stomach or of multiple injuries, such as a crushed chest; no such danger as of pneumothorax, inasmuch as both hands and arms are often severely injured; and appropriate for rapid, sure, and safe administration in the event of mass casualties, as in time of severe disasters. The regional block described here appears to meet these requirements.

Regional Anatomy

Figure 1 shows the level at which the block is administered—within 2 cm. of the distal edge of the broad tendon of the pectoralis major. The general

pattern of structures in this neurovascular space (see cross-section) reveals the brachial artery to be centrally located and surrounded by all the nerves to the entire forearm and hand. The space is surrounded by a sturdy fascia.

The goal is to bathe all these nerves with sufficient anesthetic solution so that sensory conduction will be completely arrested. It is unnecessary to cause paresthesias by impaling the nerves on the needle or to inject into a nerve.

I have found a 2% solution of lidocaine (Xylocaine) hydrochloride with a 1:200,000 dilution of epinephrine (Adrenaline) to be adequate for even the longest procedures that may last up to four or five hours. In the first 12 cases, I used only a 10-ml. to 12-ml. solution in this neurovascular space

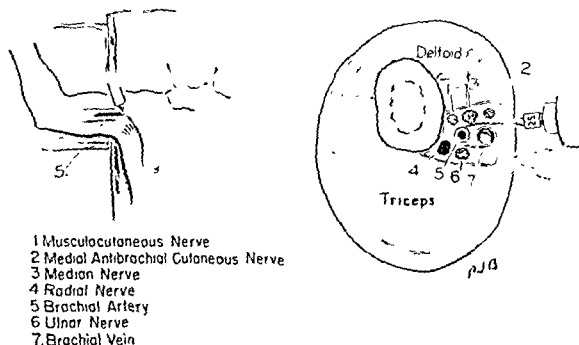


Fig. 1.—Block of great nerves of upper arm, with cross-sectional anatomy.

in the adult with complete anesthesia. In cases 13 and 14, partial failures occurred, probably due to heavy premedication that resulted in a lowering of the systolic blood pressure below 90 mm. Hg, which apparently made accurate identification of the position of the brachial artery somewhat uncertain. In the last 42 cases, I have increased the amount to a total of 16 ml. with complete anesthesia. Relatively few sedatives or narcotics are now given prior to initiating the block.

The shoulder, axilla, and upper arm are first prepared. The patient lies on his back with his arm placed straight out from his shoulder on an adjacent table. The elbow is flexed at 90 degrees and the forearm placed flat on the table. This procedure externally rotates the upper arm and places the neurovascular space uppermost over the humerus. The area is then draped.

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Presented, in part, as a Scientific Exhibit at the 107th Annual Meeting of the American Medical Association, San Francisco, June 23-27, 1958.

The operator wears sterile gloves and stands by the head of the patient so that his palpating fingers come down over the belly of the biceps brachii muscle to find the brachial artery just distal to the pectoralis major tendon (fig. 2).



Fig. 2.—Injection site.

The index finger of the palpating hand is kept on the artery. There is little fat tissue here even in the stoutest patient; hence, a syringe with only a $\frac{5}{8}$ -in., 25-gauge needle is centered over the artery. The needle is pressed through the skin into the subcutaneous fat, depositing an imperceptible amount of solution constantly. Now the needle is tipped barely to miss the brachial artery and is pushed in until it very clearly "pops" through the fascia. It is pushed on until it is estimated that the point is next to the brachial artery (fig. 1). The plunger is withdrawn partially to test whether the point is in a vessel, while the needle is withdrawn nearly $\frac{1}{2}$ in. If no blood appears, 8 ml. of solution is deposited as the needle is moved in and out over a range of $\frac{1}{2}$ in. to distribute it throughout this part of the neurovascular space.

The needle is then withdrawn from the fascia, but not from the skin, and pressed in to lie near the other side of the artery. Here another 8 ml. is deposited while the needle is moved through a $\frac{1}{2}$ -in. range. Each puncture of the fascia is clearly perceived by the operator, even in the thin fascia of children.

It usually requires up to 25 minutes for complete anesthesia to occur. Inasmuch as the success of the block depends on depositing the solution where it will be easily absorbed by the enveloping nerves, the systolic blood pressure should be greater than 100 mm. Hg to make for certain identification of the site of the artery.

Block of Superficial Nerves

Open surgical procedures in the hand and forearm are usually performed with more safety in a bloodless field. I use the Koch-Mason technique of applying a wide blood pressure cuff, high in the upper arm, pumped to a pressure of 280 mm. Hg. Whereas the block arrests conduction in all the nerves to the arm below the elbow, it does not come near the superficial or skin sensory nerves from the cervical plexus, the intercostobrachial nerve, or the perforator branch of the circumflex axillary nerve. Inasmuch as pain arises at the proximal end of the pressure device, I invariably block these sensory nerves with a "ring" type of subcutaneous block with 8 to 10 ml. more of the solution at the level of the block of the great nerves (fig. 3).

Sympathetic Block

The sympathetic block was used twice daily for a week in place of a stellate ganglion block to release arterial spasm. The block alone can be accomplished in 30 seconds without the use of extensive skin preparation or draping. The patient did not on any occasion complain of pain during introduction of needle or solution, as so many do when the stellate ganglion is sought.

Comment

The regional nerve block has been used successfully in 52 patients for major surgical procedures in the hand and for one open reduction of both bones of the forearm. The patients have ranged in age from 2 to 76 years. The children received proportionately less solution, e. g., a total of 8 to 10 ml.

It is my impression that the block of these great nerves in the upper arm should be used in every case—in young or old patients, with good or bad

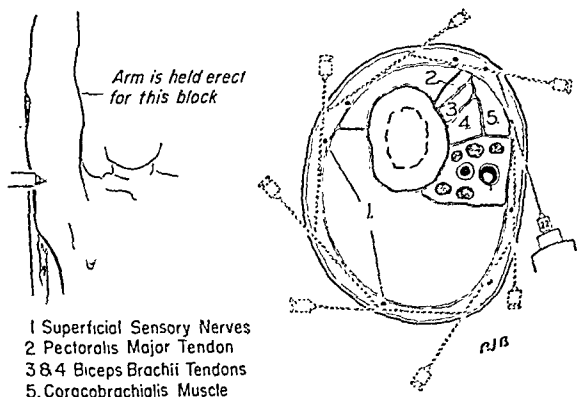


Fig. 3.—Block of superficial sensory nerves of upper arm, with cross-sectional anatomy.

risk, and under elective or urgent conditions. It is a good procedure not only for the operating room but also for the emergency room, for the physician's office, and in the makeshift housing that may

follow disasters. It is easy to perform if the systolic blood pressure is sufficient to make certain the identification of the site of the brachial artery.

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The lidocaine hydrochloride used in this study was supplied as Xylocaine hydrochloride by Astra Pharmaceutical Products, Inc., Worcester, Mass.

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RESECTION OF MULTIPLE METASTATIC PULMONARY LESIONS OF OSTEOGENIC SARCOMA

Alfred T. St. James, M.D., Wallingford, Conn.

Despite the ever-widening horizons of surgery, resection of metastatic malignant lesions, especially multiple metastatic malignant lesions, has not reached a point of full acceptance by the medical profession. The idea is not a new one, for as long ago as 1853 Kroenlein¹ reported a case. Since that time other reports have appeared in the literature, and, as one might expect, the number of reports has increased in recent years. Nevertheless, experience with operation for metastatic malignancy remains both limited and incomplete, especially as to long-term follow-up studies.

At the present time surgical resection of solitary pulmonary metastases is on rather firm ground. Alexander and Haight² collected 24 cases from the literature in 1947. Experience at the Mayo Clinic was reported by Hood and associates³ in 1955; they included a total of 43 cases. Of interest is the fact that their first resection took place in 1941, and 10 years later, in 1951, they had 13 cases. In 41 of the 43 cases, however, the lesions were solitary. In the two that were not solitary, the lesions appeared as satellite nodules rather than as widely separated lesions. Mannix⁴ reported use of resection in a patient with multiple pulmonary metastases occurring after osteochondrogenic sarcoma of the tibia. His patient had five metastatic nodules in the basilar segments of the left lower lobe and one in the lingula pulmonis. The patient was treated with basilar segmentectomy and local resection of the lesion in the lingula. At the time of the report, 24 months after operation, the patient was alive and well. A recent case at the Meriden (Conn.) Hospital was similar to the one reported by Mannix, and it is herewith presented.

Report of a Case

A 16-year-old boy was readmitted to the Meriden Hospital on May 15, 1956, nine months after a high, right thigh amputation had been performed for osteochondrogenic sarcoma. He had been given regular follow-up examinations after the amputation. Chest x-ray findings in January, 1956, were normal. However, a film obtained three weeks prior to the second admission revealed a round, solitary shadow in the right upper lung field (fig. 1). There was no cough, hemoptysis or chest pain. The patient was asymptomatic.

Examination revealed a healthy youth appearing neither acutely nor chronically ill. The temperature was 98.6 F (37 C), blood pressure 120/80 mm. Hg, and pulse rate 72 per minute. There was no dyspnea or cyanosis. The head and neck were normal. There was no cervical lymph adenopathy. The lungs were clear to percussion and auscultation, and the remainder of the physical examination was not revealing with the exception of a well-healed, high, right thigh amputation. Blood studies revealed the hemoglobin level to be 14.3 Gm. per 100 cc. and leukocytes, 9,250 per cubic millimeter, with 56% neutrophils, 1% basophils, 2% eosinophils, 36% lymphocytes, and 3% monocytes. Urinalysis gave normal findings, as did serologic testing. The patient's blood group was B, Rh-positive. An x-ray of the chest revealed a solitary, rounded shadow 2.5 cm. in diameter in the anterior segment of the right upper lobe. The remainder of the lung field was normal. There was no evidence of any pleural fluid.

On May 17, 1956, a right thoracotomy was performed, and a round, hard tumor nodule 2 cm. in diameter was found in the anterior segment of the upper lobe of the right lung. There were also two small nodules in the superior segment of the lower lobe, one posteriorly and the other in the oblique fissure. These each measured 0.5 cm. in diameter. No other nodules were visualized or could be palpated. The lung was entirely free of adhesions. There was no pleural fluid present. Preoperatively, it had been planned to perform right upper lobectomy. The presence of the two nodules in the middle lobe, however, precluded this eventuality, and, accordingly, three local resections were performed of the three metastatic nodules. The chest was closed with underwater drainage. The postoperative course was benign and uneventful, and the patient was ready for discharge on the 11th postoperative day.

Read before the annual meeting of the Connecticut Society of American Board Surgeons, New Haven, Conn., Dec. 10, 1957.

Examination of the resected specimens revealed osteochondrogenic sarcoma (fig. 2). After a period of one year, the patient was still free of demonstrable disease.

Comment

The criteria for acceptance of patients for resection of metastatic pulmonary malignancy are not hard and fast. One can only say that small, rather than large, lesions are the more favorable; solitary, rather than multiple, lesions are more favorable; and melanomas, teratoma of the testis, and carcinoma of the rectum are less favorable than others. Generally speaking, sarcomas have a better prognosis than do carcinomas. Jaffe⁵ has pointed out that osteochondrogenic sarcoma tends to metastasize to only one lung, whereas osteosarcoma tends to have a bilateral spread, and workers at this hospital are pleased that our case falls into the former group.

In this case, as well as in that of Mannix,⁴ it was not recognized preoperatively that the patient had multiple metastatic lesions. Rigler⁶ has pointed out that, when favorably located, metastatic nodules 2 mm. in diameter have been found on x-ray study of the chest. The smallest lesion in Mannix's patient that had not been visualized in the preoperatively x-ray was 4 mm. in diameter. The lesions not visualized preoperatively in the present patient measured 5 mm. in diameter. Hence, it seems safe to say that, although lesions of only 2 mm. may be visualized, a lesion must be over 5 mm. in diameter before it can be detected with certainty.



Fig. 1—Chest x-ray, showing coin lesion in right upper lung field.

One need not justify thoracotomy for solitary pulmonary shadows, for not only have favorable results been reported after resection of metastatic disease but also the possibility exists that the

shadow may represent a primary bronchogenic carcinoma and that the patient may be cured of his former disease. No doubt had the multicentric nature of the metastases been recognized in this case, operation would have been denied the patient. He

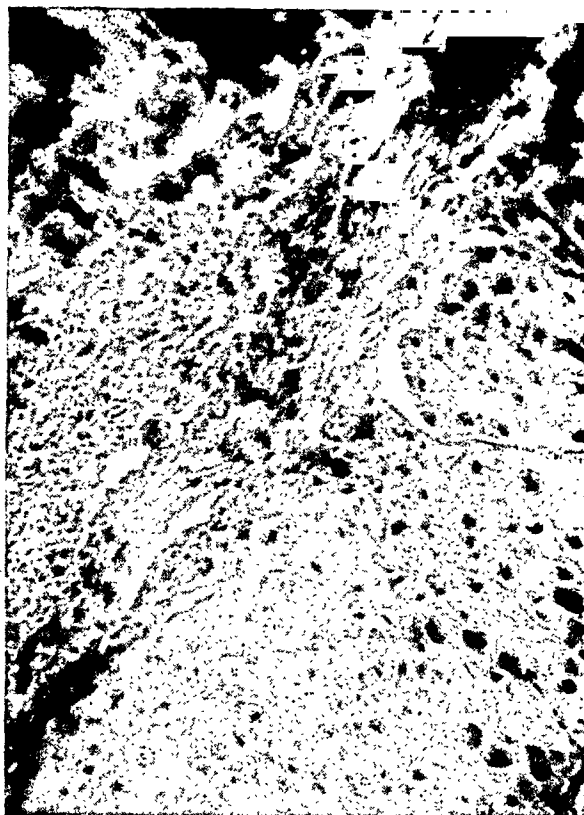


Fig. 2—Microscopic section of resected specimen, showing cartilage-forming metastatic tumor.

is, however, alive, well, and free of demonstrable metastases two years postoperatively. Therefore, a plea is made to extend the limits and concepts of surgery for resection of metastatic lesions to include multiple metastases in favorable cases.

26 Fair St.

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IATROGENIC STIFF SHOULDERS

Robert G. Thompson, M.D.

and

Edward L. Compere, M.D., Chicago

The normal shoulder joint is capable of motion in several directions. The glenohumeral joint contributes the greatest part of the total motion of which the shoulder joint is capable. There is some argument as to the ratio of motion between the glenohumeral and the scapulothoracic articulation, but there is general agreement that at least 120 degrees of motion occur at the glenohumeral joint from adduction to complete abduction of the arm. When the arm is at the patient's side or in complete adduction, the inferior part of the shoulder capsule, of necessity, is quite lax and is believed to fold somewhat in the manner of an accordion. The capsule is obviously stretched out when the arm is at its extreme range of abduction, namely, about 180 degrees. With the arm held in adduction there is a great tendency for adjacent folds of the shoulder capsule to become adherent to one another, particularly if this position is maintained for any length of time. It has been observed that a period as short as two to three weeks of persistent adduction is sufficient to cause severe adhesion formation in the shoulder joint capsule.

It is the habit of a number of surgeons who treat trauma to the upper extremity to immobilize the patient's arm in a sling, a Velpeau dressing, a shoulder spica, a hanging cast, or some other type of fixation. To obtain adequate healing of hand injuries or forearm or elbow fractures, immobilization is required of the affected areas. However, too often the entire arm and shoulder are immobilized for six to eight weeks or longer. Many patients with a completely healed Colles' fracture return to the treating physician complaining of pain and stiffness in the shoulder. They are unable to raise their arm above shoulder level.

Patients will not do what may appear to them to be unnecessary movements. They will not exercise their shoulder joints unless specifically instructed to do so by their physician. Any patient who has a fracture involving the fingers, hand, forearm, or elbow, and is immobilized in a short or long arm cast with or without the use of a sling, should be specifically told on repeated occasions that the arm should be raised above the head several times a day (see figure). If this simple procedure is carried out several times each day, much future suffering and disability can be prevented.

As orthopedic consultants to a rehabilitation center, we have been impressed by the number of stiff shoulders that we have found it necessary to treat after an injury to the hand or arm had healed. A survey of 130 patients with arm or hand injuries

admitted to the Liberty Mutual Rehabilitation Center in Chicago from Jan. 1, 1957, to Jan. 1, 1958, revealed a total of 11 patients who had suffered no known injury to the shoulder but were found to have less than normal motion of the shoulder of the arm which had been treated. These patients were questioned, and none recalled that the treating physician specifically instructed them to move the arm at the shoulder through a full range of motion several times each day during the period of immobilization. These patients ranged in age from 34 to 63, with a predominant number above the age of 40 (see table).



Exercise position for fractures of the arm to prevent subsequent stiff shoulder with limited range of movement.

It is a well-known fact that shoulder joints tend to become stiffer with age, particularly above the age of 40. It is therefore doubly important to emphasize to these older patients that they must perform full shoulder motion at least two or three times each day. The exercise of the shoulder should be demonstrated to the patient. Few patients understand what is meant if they are merely told that they should move the arm through a wide or full range of motion. Another exercise, which is also

demonstrated to the patient at the same time, is the way the fingers are to be moved. It is not adequate to simply wiggle the fingers, but a complete fist should be made. If the cast does not permit, it should be trimmed enough to allow full flexion and extension of the metacarpal phalangeal joints.

Treatment of Iatrogenic Stiff Shoulders in Eleven Patients

Age, Yr.	Diagnosis	Interval Between Injury and Admission, Wk.	Shoulder Motion on Admission			Shoulder Motion at Discharge		
			Ab-duc-tion, De-gree	Flex-ion, De-gree	Days of Ther-apy	Ab-duc-tion, De-gree	Flex-ion, De-gree	
55	Colles' fracture	8	75	110	23	115	160	
61	Hand amputation	12	75	80	108	160	180	
38	Arm amputation	6	75	95	61	80	100	
56	Forearm amputation	12	75	110	17	95	135	
47	Forearm burns	20	85	110	22	90	120	
54	Fracture, radius & ulna	28	130	135	32	180	180	
63	Monteggia fracture	34	110	165	5	115	165	
46	Soft tissue arm injury	8	80	95	43	100	125	
34	Fracture, dislocated elbow	8	80	105	31	110	130	
39	Fracture, radius & ulna	12	100	140	25	100	150	
59	Arm amputation	12	85	115	23	100	135	

Once a shoulder becomes stiffened, a very difficult therapeutic problem is presented. These patients usually have pain primarily as a result of the limitation of motion. Any attempt to stretch the frozen shoulder will cause severe pain. Because it is painful, most patients resist the therapeutic movement. As can be noted from the table, full shoulder motion was obtained in only one case, and

that after vigorous therapy for many days. Several cases of the frozen shoulder syndrome required forceful manipulation of the shoulders with the patient under complete anesthesia in order to restore a satisfactory range of motion.

Summary

The prevention of shoulder stiffness after injuries of the forearm and hand treated by slings or casts or other shoulder immobilization devices requires the active cooperation of each patient. This is accomplished by definitely instructing each patient in a very simple, short exercise of the shoulder, to be performed several times each day. Each of 11 patients in a total group of 130 patients who were treated at the Chicago Rehabilitation Center were found to have varying degrees of stiffness or fibrous ankylosis of their shoulder joints after an injury to the distal part of the arm. This stiff and painful shoulder complication could have been prevented. All patients who have arm injuries which do not involve the shoulder joint should be instructed by the treating physician to carry out definitive exercises of the shoulder joint several times each day. Physicians should try not to commit sins of omission just as they try to avoid sins of commission.

720 N. Michigan Ave. (11) (Dr. Thompson).

Statistical data were prepared by the staff of the Liberty Mutual Rehabilitation Center.

COUNCIL ON DRUGS

NOTICE OF CHANGES IN OPERATION

Descriptions of New and Nonofficial Drugs

In order to further reemphasize that descriptions of drugs published by the Council do not, in any case, imply approval, endorsement, or acceptance, the Council has voted to restate this fact in the introduction to all future monographs and supplemental statements which are published in THE JOURNAL for inclusion in its annual publication, New and Nonofficial Drugs. Although this fact was announced at the time the Council's seal-acceptance procedure was replaced in 1955 by the current evaluation program and has been clearly stated in all subsequent editions of the Council's annual publication, physicians generally should be aware that each drug description is designed to provide fair comment and criticism based on available evidence, whether or not this is considered adequate to establish usefulness. Physicians are urged to read each description to gain a proper appreciation of the Council's views concerning the actions, uses, hazards, and dosage of individual drugs.

More Prominent Listing of Trade Names

In order to make descriptions of drugs more easily identified by physicians who may be familiar with only their commercial names, the Council has voted to place these names in parentheses immediately after the nonproprietary titles of all subsequently published monographs (and in supplemental statements on previously evaluated drugs), instead of at the end or in the text of such descriptions. This change in format is being implemented simultaneously in THE JOURNAL and for the 1960 edition of New and Nonofficial Drugs.

Identification of Commercial Sources

The Council also has authorized the identification of commercial sources of described drugs, of which it has knowledge or is informed, in the index for the 1960 and future annual editions of New and Nonofficial Drugs. The Council voted to indicate such sources parenthetically after all applicable commer-

cial names (proprietary or nonproprietary) as they appear in the general index rather than in conjunction with monographs and to provide a separate

alphabetic appendix of the complete organizational names and addresses of such sources as a further supplement to this information.

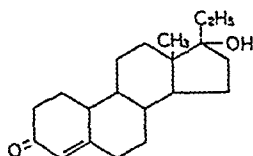


NEW AND NONOFFICIAL DRUGS

The following descriptions of drugs are based upon available evidence and do not in any case imply endorsement by the Council.

H. D. KAUTZ, M.D., *Secretary.*

Norethandrolone (Nilevar).—17 α -Ethyl-17-hydroxy-19-nor-4-androsten-3-one.—The structural formula of norethandrolone may be represented as follows:



Actions and Uses.—Norethandrolone, introduced commercially in 1956, is a synthetic steroid hormone, which is related chemically and pharmacologically to testosterone. The drug exhibits androgenic properties, which are not as pronounced as with testosterone and its esters. Hence, norethandrolone is not used as an androgen. It does, however, exert a significant anabolic effect, which forms the basis for its clinical use. In laboratory experiments and short-term clinical studies, promotion of protein anabolism as evidenced by a reversal of a negative nitrogen balance has been demonstrated; the anabolic potency of the drug is approximately equal to that of testosterone and its esters. Accordingly, norethandrolone has been employed clinically in situations in which problems of protein catabolism are encountered. These include such conditions or circumstances as preparation for and recovery from surgery, recovery from severe illness, recovery from burns and severe trauma, nutritional care in wasting diseases such as carcinomatosis and tuberculosis, domiciliary care of decubitus ulcer in the chronically ill, and care of malnourished children and premature infants. Although the foregoing uses of the drug might logically follow because of its anabolic effect, they are at present considered theoretical. As yet, there is no evidence that a positive nitrogen balance can be maintained for prolonged periods of time, nor is there any direct evidence that, if this

were so, such a therapeutic regimen would shorten convalescence, diminish surgical morbidity, or provide any additional benefits which could not be achieved by an adequate diet alone. Thus, although it can be considered logical to employ norethandrolone for the treatment of conditions characterized by a wasting of body protein, further critical research is necessary to substantiate its ultimate utility for this purpose.

In addition to the property of reversal of negative nitrogen balance already described, under certain circumstances, the drug also effects a decreased loss of calcium; this property suggests its employment in certain conditions in which a greater degree of calcium retention is desirable. To the present time there is no evidence that norethandrolone increases bone age or speeds the closure of epiphyses in prepuberal children.

Norethandrolone, although less androgenic than testosterone and its esters, is capable of producing virilizing effects, especially after large doses or prolonged periods of use. For this reason it is contraindicated in patients with prostatic carcinoma. It may also exert progestational activity, causing endometrial proliferation and withdrawal bleeding in adult women. This reaction is more prone to occur if dosage is high or if therapy is terminated abruptly. Nausea and vomiting, which are seldom severe enough to require discontinuance of therapy, have been reported occasionally. Fluid retention and edema can also occur. The drug should therefore be administered cautiously to patients with demonstrable or incipient circulatory or renal failure and should be discontinued at the first sign of fluid retention. It should not be employed in nephrosis or the nephrotic stage of nephritis since it may effect an increased lipemia in such patients. Because norethandrolone alters electrolyte balance,

it should not be administered to patients with severe burns or trauma during the acute phase of these conditions.

Norethandrolone may alter liver physiology, probably in a manner similar to methyltestosterone, and a few instances of jaundice have been reported. This manifestation is reversible and may not be evidence of true liver toxicity, although it is an indication for prompt discontinuance of the drug. The alteration of liver physiology may result in abnormal values in serum bilirubin, in serum transaminase, and in sulfobromophthalein determinations. However, in the absence of underlying liver disease, other liver function tests are normal. Continuous administration of norethandrolone for periods longer than three months is considered inadvisable, although a second such course may be initiated after a rest period of one month.

Dosage.—Norethandrolone is administered orally or intramuscularly. Although dosage is highly variable, the average daily dose for adults usually ranges from 30 to 50 mg. Amounts as high as 100 mg. per day have been administered, but at this dosage level definite androgenic effects are likely to be encountered. For children, 0.5 mg. per kilogram of body weight is the usual daily oral dose.

Preparations: solution (injection) 25 mg. in 1 cc.; solution (oral) 8.3 mg. per cc.; tablets 10 mg.

G. D. Searle & Co. cooperated by furnishing scientific data to aid in the evaluation of norethandrolone.

Poloxalkol (Polykol).—An oxyalkylene polymer with the following structure:



Actions and Uses.—Poloxalkol, introduced commercially in 1958, is a relatively tasteless, nonionic, surface-active agent with actions and uses similar to those of dioctyl sodium sulfosuccinate. After oral administration, the drug lowers surface tension of water and intestinal fluids, thus tending to soften the stool and facilitate elimination. The wetting action of poloxalkol makes it potentially useful for the treatment and prevention of constipation associated with dry, hard stools. Clinical trials, thus far chiefly limited to infants and children, would indicate that the drug is often, but not always, effective in relieving chronic constipation. The action of the drug is neither rapid nor drastic; thus, several days may elapse before a therapeutic effect is apparent. Poloxalkol per se is pharmacologically inert; its fecal moistening effects are due entirely to the detergent-like physical properties of the compound. Although the drug appears to be essentially non-toxic, the possibility that it may increase the absorption of mineral oil or of fat soluble substances in harmful amounts should be borne in mind.

Dosage.—Poloxalkol is administered orally. For infants and children under three years of age, the usual dose ranges from 100 to 200 mg. once or twice daily. For children 3 to 12 years of age, the dose is 200 mg. once to three times daily.

Preparations: solution (oral) 200 mg. per cc.

The Upjohn Company cooperated by furnishing scientific data to aid in the evaluation of poloxalkol.

Use of Phenylbutazone (Butazolidin) in Acute Superficial Thrombophlebitis

The Council has evaluated the clinical use of phenylbutazone for the treatment of acute superficial thrombophlebitis. Although only a few of the available reports of investigations have been well controlled, it is the clinical impression of most observers that the drug exerts beneficial effects in some, but not all, cases. The drug apparently relieves local pain, an action dependent upon its specific anti-inflammatory activity and distinct from the antipyretic or central analgesic properties of the compound. It should be emphasized that phenylbutazone is not intended for thrombophlebitis of the deep veins but should be considered only for selected patients with the acute superficial form of the disease. The Council concluded that further controlled observations are needed to determine its ultimate value in the therapy of this condition as compared with other methods of treatment.

Since the treatment of acute superficial thrombophlebitis involves medication over relatively short periods of time, the danger of drug-induced hematopoietic depression or fluid and electrolyte retention is appreciably reduced. Nevertheless, phenylbutazone should be used cautiously, keeping in mind its known ability to produce serious untoward reactions. Treatment should be discontinued immediately upon the appearance of any toxic effect. (See the monograph on phenylbutazone in New and Nonofficial Drugs.)

In acute superficial thrombophlebitis, which fails to respond to the usual conservative measures, phenylbutazone, 600 mg. per day, may be tried in divided doses for two or three days. If no beneficial results are apparent within 72 hours, the drug should be discontinued. When indicated, 300 mg. per day may be given thereafter for an additional 5 to 7 days, but in no case should therapy be continued longer than 10 days.

The Council voted to amend New and Nonofficial Drugs to describe this additional use of phenylbutazone.

Geigy Pharmaceuticals, Division of Geigy Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of the use of phenylbutazone in acute superficial thrombophlebitis.

CHEMICAL LABORATORY

The Chemical Laboratory has authorized publication of the following statement.

WALTER WOLMAN, PH.D., *Director.*

Monographs of tests and assays for new and non-official drugs adopted by the Chemical Laboratory of the American Medical Association represent an expression of opinion as to what might constitute adequate tests and assays to serve as a reference guide to those interested in the identity and quality of a new and nonofficial drug.

Completed monographs are published in the journal *Drug Standards* for those interested in the details of the procedures. Monographs on the fol-

lowing drugs have appeared in the November-December, 1958, issue of that journal. The cooperation of the listed pharmaceutical firms that furnished samples and data is acknowledged.

Heptabarbital.....(Geigy Pharmaceuticals)
Hydrocortisone cyclopentylpropionate..(The Upjohn Company)
Mephensin carbamate.....(E. R. Squibb & Sons)
Penthienate bromide.....(Winthrop Laboratories)
Pyrimethamine.....(Burroughs Wellcome & Co., Inc.)

DIAGNOSTIC PROBLEMS

DIABETES MELLITUS COMPLICATED BY ENTEROCOCCIC MENINGITIS

Clinical Pathological Conference (PM 654-57), Nov. 14, 1957, from the Department of Pathology and the Hektoen Institute for Medical Research of Cook County Hospital, Chicago, presented for publication by Daniel S. Kushner, M.D., and Paul S. Szanto, M.D.

Clinical Data

A 64-year-old man was admitted to Cook County Hospital on May 10, 1957. Information obtained from the patient's wife revealed that he had been taking 10 to 20 units of cloudy insulin daily but that in the last week he had stopped taking insulin and had been eating little because of chills, fever, and malaise. He had been complaining of pain in the rectum and on one occasion "pus" had drained from this area. He had had a cholecystectomy in 1956.

Physical examination revealed a comatose man with Kussmaul respirations and the odor of acetone on his breath. He responded slightly to painful stimuli. His blood pressure was 110/60 mm. Hg, pulse 92 per minute and regular, and respirations 32 per minute. He appeared moderately dehydrated. Purulent drainage emerged from a fistula in ano. No significant additional physical findings were noted. The reflexes were physiological, but the patient had an abnormal response to right plantar stimulation.

The urine contained ++++ reducing substance and ++++ acetone. The serum acetone reaction was also strongly positive (++++). The blood glucose level was 1,160 mg. per 100 ml., and the blood carbon dioxide combining power was 12 vol. %. The patient's stomach was aspirated, and 600 cc. of bicarbonate solution was instilled. At 5:30 p. m. treatment was instituted, consisting of 200 units of insulin given intramuscularly and molar lactate intravenously and one million units of aqueous penicillin initially and 400,000 units of penicillin and 0.5 Gm. of streptomycin twice daily. At 8:30 p. m. 400 units of insulin and isotonic sodium chloride solution with 2 Gm. of potassium chloride were given. Urine and serum acetone tests gave positive (+++) results. He seemed slightly improved at 11:30 p. m.; urine acetone was still present (+++), and the serum acetone reaction was ++. He was given another liter of isotonic sodium chloride solution, the stomach was again irrigated, bicarbonate was instilled, and 600 units of insulin was given. By 12:30 a. m. he responded to his name and coughed but was still stuporous. Two liters of 5% dextrose in saline solution with 4 Gm. of potassium chloride was given. His blood pressure was 120/70 mm. Hg, and his urinary output was increasing.

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At 5:30 a. m. the urine glucose and acetone and serum acetone tests were all negative. The blood glucose level was 98 mg. per 100 cc., and the carbon dioxide combining power was 42 vol. %. Five per cent solution of dextrose in water was infused. The patient's blood pressure had fallen to 90/60 mm. Hg, but after infusion with arterenol it promptly rose to 110-120 mm. Hg systolic. The urine flow remained brisk. Much mucus was aspirated from the trachea, and by 8 a. m. the patient appeared improved. He was alert and able to take fluids orally. His chest was clear, blood pressure was 140/80 mm. Hg, and he was given 1 pt. (500 cc.) of blood. However, at 1 p. m. he was again semicomatose, and his temperature was 101 F (38.3 C) rectally. Marked nuchal rigidity was present. A lumbar puncture revealed an opening pressure of 135 mm.; the fluid was slightly turbid, Pandy reaction was +++, cell count revealed more than 1,000 polymorphonuclear leukocytes, and a smear showed gram-positive diplococci. He was treated for pneumococcal meningitis with 10 million units of penicillin and 4 Gm. of sulfadiazine by intravenous drip. His abdomen was somewhat distended; intestinal sounds were hypoactive.

By the next day the patient was somewhat more lucid, but the meningeal signs were unchanged. An additional 5 million units of penicillin and 4 Gm. of sulfadiazine were given by intravenous infusion. The hemoglobin level was 73% with 4 million red blood cells, 24,000 white blood cells, 30 polymorphonuclear cells, 60 band cells, 5 lymphocytes, and 5 monocytes; the platelet count was 350,000.

That night the patient had generalized irritability with occasional tremors in his left arm. The paralytic ileus which had developed with abdominal distention seemed improved, and gastric suction was no longer required. However, some generalized tenderness of the abdomen was present. The next morning his condition was unchanged except for some pulmonary congestion. The blood chemical values, which 36 hours earlier had been serum nonprotein nitrogen level, 122 mg. per 100 ml.; creatinine, 2.8 mg. per milliliter; glucose, 600 mg. per 100 ml.; chlorides, 106 mEq. per liter; sodium, 134 mEq. per liter; potassium, 3.2 mEq. per liter; and carbon dioxide, 40 vol. %, were now serum nonprotein nitrogen level, 80 mg.; creatinine, 2.3 mg. per milliliter; chlorides, 126 per liter; sodium, 144 mEq. per liter; potassium, 4.0 mEq. per liter; and carbon dioxide, 46 vol. %. Therapy with fluids and antibiotics was continued, but at 4:30 p. m. the patient died.

Culture of the spinal fluid, reported after death, revealed nonhemolytic *Streptococcus* (enterococcus) sensitive to penicillin, erythromycin, and tetracycline.

Clinical Discussion

Dr. Daniel S. Kushner: We are confronted with the problem of an elderly diabetic man, ill for one week with chills, fever, malaise, pain, and drainage of pus from the rectal area, who presented in coma with severe diabetic ketoacidosis. Of special interest in the physical examination were the draining fistula in ano and a pathological right plantar response.

He was treated in an interesting fashion which we would have to summarize as ideal, since within 12 hours he was free of acidosis, emerging from coma, and metabolically well. It is of particular interest that he received large doses of insulin, in challenge to the erroneous old concept that insulin is not effective if given in doses exceeding 50 units per hour. Here, insulin in three tremendous doses was highly effective.

The first sign that something was amiss was the development of a hypotensive state after the patient was metabolically well. The first consideration in a man at this age should be cardiogenic shock, due to myocardial ischemia, necrosis, or infarction. However, his subsequent course permits the assumption that this was bacteremic shock.

Next, associated with the fall in blood pressure, the patient again became comatose. He had nuchal rigidity, and the spinal fluid turbidity, increased protein content, and pleocytosis pointed toward a purulent meningitis. It was now apparent that he had had an as yet undefined focus of infection which precipitated his ketoacidosis, with late spread of infection to the meninges. The exact identification of the offending micro-organism now became of the utmost importance, both in establishing the probable primary site of infection and in indicating the most rational therapy. Gram-positive diplococci were observed on smear of the spinal fluid. It would be valuable to know whether the organisms were lanceolate, whether they were, in addition to the pairs, arranged in clusters or in short chains, and whether any occurred intracellularly. Such observations would permit deductions regarding the probable presence of pneumococci, staphylococci, or streptococci respectively. Also, too often we think of intracellular organisms only in relation to Neisserian infection, but any bacterium present in pus will become engulfed by leukocytes; therefore the presence of bacteria within cells leaves no doubt that they are causing infection. After the patient's death, the culture was reported as nonhemolytic *Streptococcus* (enterococcus), which was sensitive to penicillin, erythromycin, and tetracycline. The sensitivity of this organism to penicillin would be unusual for the enterococcus.

Dr. Metzger: These organisms were resistant to heat and bile-insoluble, thus distinguishing them from pneumococci and placing them in the enterococcus group.

Dr. Kushner: Too often gram-positive diplococci observed on smear are assumed by the clinician to be pneumococci. The enterococcus (group D streptococcus) may be spherical, ovoid, or even lancet-shaped, but it is typically "berry" shaped, forming pairs, double pairs, and even diplococci or short chains, and it may be alpha, beta, or gamma hemolytic. In addition to its insolubility in bile and resistance to heat, the enterococcus grows in 6.5% sodium chloride solution, also at pH 9.6, and it ferments esculin.

Once we accept the fact that the offending organism was, in fact, enterococcus, which is a fecal organism, we must look for an intra-abdominal focus of infection, from which septicemic spread culminated in purulent meningitis.

Also, from the clinical point of view, a pneumococcal etiology might have been considered unlikely because the patient had no primary pneumococcal focus, no pneumonia, otitis media, sinusitis, or skull fracture, which perhaps 75% of patients with pneumococcal meningitis characteristically exhibit. More important, the patient's onset of illness coincided with a possible focus in the infected fistula in ano. Moreover, while he was being adequately treated for meningitis he developed signs of peritonitis or paralytic ileus, again pointing toward an intra-abdominal focus of suppuration. The increasing abdominal distention initially could be explained by paralytic ileus as occurs with any septicemia or meningitis; but the generalized abdominal tenderness observed later forces one to the conclusion that he had developed peritonitis. He also was azotemic, probably on an extrarenal basis, as one sees in peritonitis and other intra-abdominal suppurative conditions. However, since his problem is one of sepsis, he also might have had abscesses in the kidney, contributing to the azotemia.

We should try to define not only what type of meningitis this diabetic had but how it began, how it spread, and how it caused his death.

The review of enterococcal infections by Rantz and Kirby¹ emphasized the frequency of genitourinary and abdominal primary foci. The patient under discussion could have had a silent ruptured appendix or silent relapsing pancreatitis. We have seen one previous instance of diabetes complicated by purulent meningitis due to a fecal organism, *Aerobacter aerogenes*, which spread from multiple pancreatic abscesses superimposed upon a chronic relapsing pancreatitis. However, I am inclined to relate the peritonitis in this instance to the rectal abscess or to a hematogenous spread from a systemic infection.

The other characteristics of enterococcal infection are its frequent occurrence in the aged, the prominence of abscesses distributed throughout all the organs, the frequency of endocarditis superimposed upon normal heart valves, and its tendency

to produce cerebral, myocardial, and splenic abscesses. The latter is interesting in view of the reported cases of bacterial endocarditis which could not be cured until splenectomy was performed to remove this feeding focus. Also, incidentally, such splenic abscesses may leak into the peritoneal cavity and result in purulent peritonitis. There is nothing to point toward any of these suppurative complications in this patient except, perhaps, for the possibility of multiple brain abscesses in relation to his focal signs of left arm tremors and abnormal right plantar response.

How should this man have been treated? Certainly, 10 to 15 million units of penicillin and 2 Gm. of streptomycin daily have been adequate for enterococcal bacteremia, although still higher doses would be preferable in the treatment of meningitis. The *in vitro* sensitivity of the enterococcus is of no value in guiding therapy; in fact, it is misleading. Remarkably enough, in this case the organisms were reported to be sensitive to both penicillin and tetracycline. The enterococcus is characteristically resistant to penicillin and sensitive to tetracycline, in the test tube only. Empirically, however, therapy with tetracycline leads to a high rate of failure, relapse, and mortality. On the other hand, paradoxically, a combination of penicillin and streptomycin in high doses leads to recovery in 60% of cases, even in bacterial endocarditis. An explanation lies in the difference between the bactericidal and bacteriostatic end points of the respective antimicrobial agents.² Whereas with the tetracycline group the margin between these two levels is very wide, with penicillin and streptomycin it is very slight. Thus, the concentrations necessary to inhibit growth of enterococci are up to 3 units per milliliter for penicillin and 25 mEq. per milliliter for streptomycin. The concentrations required to kill enterococci are 10 units per milliliter for penicillin but still only 25 mEq. per milliliter for streptomycin. The blood levels achievable with penicillin range to 10 units per milliliter at dosage levels of 4 million units per day and to 150 units per milliliter at doses over 20 million units per day. Two Gm. of streptomycin daily produces levels of 25 mEq. per milliliter, and 4 Gm. produces levels ranging to 100 mEq. per milliliter. It is generally considered desirable to achieve a blood level which is 4 to 10 times greater than the bacteriostatic end point. Thus is explained the recommendation for treatment of serious enterococcal infections with doses of penicillin in excess of 12 million units and streptomycin 2 to 4 Gm. daily, approaching bactericidal blood levels. All of these considerations would be much facilitated if the bacteriologist would determine and report the bactericidal rather than inhibitory (bacteriostatic) end points in the *in vitro* sensitivity studies of the organism. These would provide a more appropriate index to the choice and dosage level of antimicrobial agents.

In summary, I would assume that this patient's primary infection was a perirectal abscess associated with a fistula in ano. From this he developed a dissemination of infection which led to diabetic acidosis. The dissemination may have occurred

Morphologic Changes Encountered in Diabetes Mellitus

Organ	Gross Lesions	Microscopic Findings
Pancreas	Atrophy	...
	...	Hydropic (glycogenic) vacuolization
	Lipomatosis	...
	...	Hyalinization and fibrosis
	...	Degranulation of beta cells
Liver	...	Lymphocytic infiltration of the islands of Langerhans (insulitis)
	Chronic relapsing pancreatitis	Acute and chronic pancreatitis
	...	Fatty metamorphosis
	...	Glycogen in nuclei of hepatic cells (ballooning)
	...	Hyaline thickening of afferent and (characteristically) efferent arterioles
Kidney	Arteriolonephrosclerosis (nonspecific but appears earlier and is more severe than in nondiabetics)	...
	Glycogen nephrosis	In less than 10% of patients dying of diabetic coma. Glycogen chiefly in cytoplasm of epithelial cells of distal convoluted tubules and Henle's loops
	Fatty nephrosis	Fat deposit chiefly in proximal convoluted tubules
	Interacapillary (nodular) glomerulosclerosis (Kimmelstiel-Wilson syndrome; occurs in long standing cases)	Deposits of homogenous material in central region of glomerular tufts
	Acute and chronic pyelonephritis (nonspecific but quite frequent in diabetes)	...
Cardio-vascular system	Neerotizing papillitis (characteristic but not pathognomonic for diabetes)	Ischemic; suppurative necrosis of tip of renal pyramids
	Arteriosclerosis more frequent and more severe in diabetics than in nondiabetics	...
	Marked coronary sclerosis; myocardial infarction	...
	...	...
	...	...
Skin	Xanthoma diabeticorum	...
	Neerobiosis lipidica diabeticorum	Plaques due to homogenization of collagen fibers of dermis
	Insulin lipodystrophy	Localized atrophy of subcutaneous tissue
Eyes	...	...
	Cataract (more frequent in juvenile diabetics than in the corresponding nondiabetic age group)	...
	Retina: small punctate hemorrhages (possibly microaneurysms); hard white exudates; retinitis proliferans	...
Nervous system	Cerebral arteriosclerosis	...
	...	Glia (astrocytic) proliferation in cerebral cortex (possibly due to episodes of hyperinsulinism)
Peripheral nervous system (diabetic neuropathy)	...	Demyelination of peripheral nerve

directly to the meninges, through the vertebral veins of Batson, without septicemia. More likely, a pelvic phlebitis, in relation to a pelvic abscess, resulted in septicemia and hematogenous spread of infection to the meninges, with or without cerebral abscesses. Terminally, peritonitis could have re-

sulted from secondary rupture of a pelvic abscess or rupture of a splenic abscess which occurred in the course of an enterococcic septicopyemia.

We do not make the fullest use of every available facility to get specific bacterial diagnoses in such a case. Among the indications for blood culture are pneumonia, meningitis, and urinary tract infection. If the same organism could have been recovered from the blood as was obtained from the spinal fluid, it would have been most helpful.

Dr. Donald Atlas: This patient was azotemic, with a blood nonprotein nitrogen level of 122 mg. per 100 cc. and a creatinine level of only 2.8 mg. %. This indicates the disproportion between nonprotein nitrogen and creatinine levels that is seen in acute extrarenal azotemia rather than primary renal failure. The creatinine can be excreted through the tubules, whereas the urea is filtered only at the glomerular level. In the presence of an overwhelming infection there is an intense stimulus to nitrogen

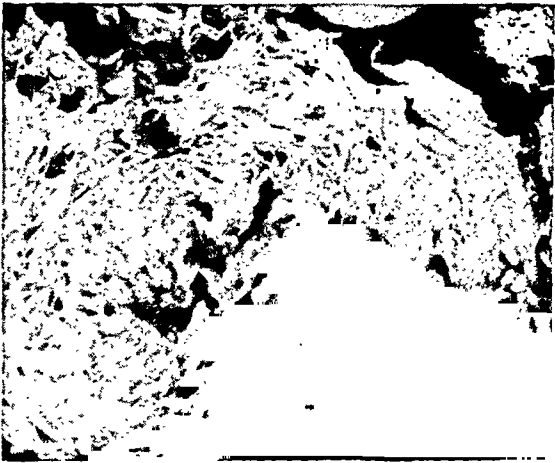


Fig. 1.—Cut section of cystadenoma of pancreas. Note multiloculated structure of tumor.

breakdown far beyond what one would ordinarily expect. This is so intense that Morony recently described a syndrome of pseudoureemia due to the overwhelming effects of bacterial toxins on protein metabolism, causing an overwhelming load of nitrogen being dumped on the kidneys.

Dr. Benjamin Gasul: Is the purulent meningitis a certainty? Could this not be a brain abscess or an epidural spinal abscess with rupture into the leptomeninges? The pressure here was not very elevated. Are 1,000 cells sufficient to diagnose a purulent meningitis?

Dr. Kushner: If the brain abscesses were bacterial in origin, their rupture would lead to purulent meningitis anyway.

Dr. Gasul: I agree. It is almost impossible from the data available here to determine the mode of spread of the meningitis.

Clinical Diagnosis.—The final clinical diagnosis was enterococcic meningitis and peritonitis due to pelvic (ischio-rectal) abscess secondary to fistula in ano in a diabetic.

Pathological Data

Dr. Paul B. Szanto: The most important morphologic changes which may be encountered in diabetes mellitus include those which are characteristic of diabetes and which are related to the basic metabolic disorder and others which may be associated with diabetes mellitus (see table). Absence of demonstrable pathological lesions in the pancreas does not exclude the possibility of a deficiency of insulin production resulting from an inadequate amount of islet tissue (hypoplasia) as a cause of diabetes. The role of the anterior lobe of the pituitary gland in the pathogenesis of diabetes must also be mentioned. In our material, relapsing pancreatitis is associated with severe diabetes in about 2% of fatal cases. An exacerbation of relapsing pancreatitis may precipitate diabetic coma.

In the case under discussion, the patient appeared well developed and well nourished. The pleural and peritoneal cavities were free of fluid. The heart was moderately enlarged (360 Gm.). The left ventricle was dilated and hypertrophied. Arterio-



Fig. 2.—Low magnification showing cystic spaces.

sclerotic plaques caused moderate narrowing of the coronary arteries, and foci of fibrosis were found throughout the myocardium.

Bilateral pulmonary edema was present, and a small calcified left bronchopulmonary lymph node was found. The spleen was of normal size (120 Gm.), and its consistency was somewhat decreased. Microscopically, the arterioles were thickened, and the red pulp showed reticulum cell reaction inter-

mingled with polymorphonuclear leukocytes, an acute splenitis reflecting a focal or generalized infection.

A fistula in ano was noted, but there was no evidence of ischiorectal abscess. The peritoneal cavity was free of fluid. Some of the small intestinal



Fig. 3.—High magnification showing epithelial lining of cysts.

loops showed loss of their shiny appearance due to the deposit of minimal amounts of fibrin, as evidence of an early focal peritonitis.

The kidneys were smaller than normal (250 Gm. together). A few scattered glomeruli were fibrosed, but the remainder were normal. The arterioles showed definite thickening.

The pancreas was normal in size (100 Gm.). The head of the pancreas was firm, and its lobular pattern was distorted by fibrous strands of connective tissue. Both the common bile duct and the pancreatic duct were moderately dilated, and each opened separately into the papilla of Vater. Histologically, in the head of the pancreas there was an increase of interlobular and intralobular connective tissue. The few islands of Langerhans were hyperplastic. Starting from the distal portion of, and sharply delineated from, the head of the pancreas, the pancreatic parenchyma was replaced by tumor tissue occupying also the proximal half of the body of the pancreas.

The tumor was multiloculated and consisted of large and small cysts which contained serous or gelatinous material and which were separated by broad bands of connective tissue (fig. 1). Within

the tumor tissue, the pancreatic duct was not identifiable. Histologically, the cysts were separated from each other by slender and broad bands of connective tissue stroma (fig. 2). Some cysts were lined by cuboidal and others by markedly flattened epithelium (fig. 3). In some parts of the tumor,

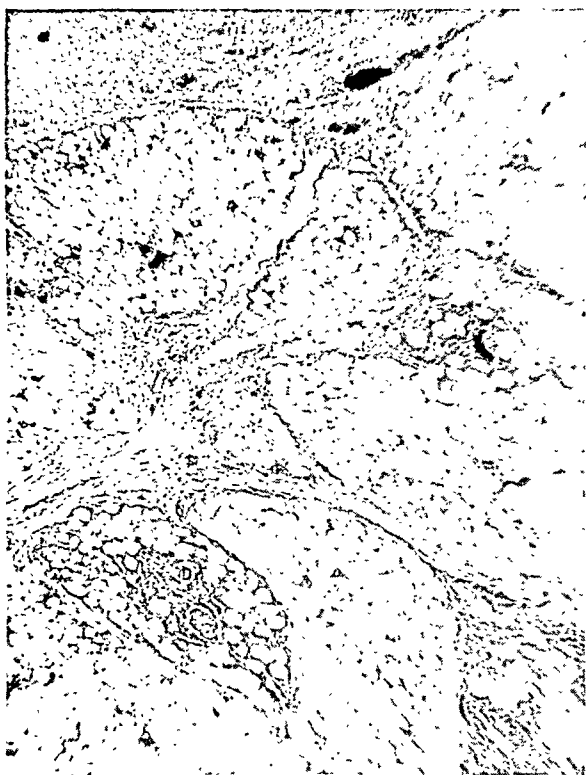


Fig. 4.—Replacement of tail of pancreas by fat tissue.

extensive calcification of the connective tissue was noted. The morphologic appearance of the tumor was that of cystadenoma of the pancreas, although it was not encapsulated. Because of the atypical location and evidence of associated chronic pancreatitis, the possibility exists that this is not a true cystadenoma, but regenerating, proliferating ductal structures as a part of the chronic pancreatitis. Still another possibility is that of a hamartoma. Because of the sharp demarcation, absence of the main pancreatic duct and complete absence within the tumor of any pancreatic structures (islands of Langerhans), the diagnosis of cystadenoma is acceptable. The distal portion of the body and tail of the pancreas were largely replaced by fat tissue (fig. 4) with a few remaining hyperplastic islands of Langerhans.

Finally, a plum-sized abscess was localized to the upper edge of the head of the pancreas. The wall of the abscess cavity was infiltrated by inflammatory cells, and occasionally vascular thrombi were seen.

The liver (1,600 Gm.) showed subacute passive congestion. Microscopically, there was marked reactive proliferation of Kupffer cells. The portal fields were enlarged and infiltrated by polymorphonuclear leukocytes. In the subcapsular part of the hepatic parenchyma, abscesses were found measuring up to 1 to 2 cm. in diameter. The surrounding parenchyma was heavily infiltrated by acute and chronic inflammatory cells. The adjacent branches of the portal vein were occluded by recent thrombi (fig. 5). These were pylephlebitic abscesses secondary to the pancreatic abscess.

The brain was of normal size (1,350 Gm.). The meninges were injected but grossly showed no evidence of a purulent meningitis. Microscopically, there was some meningeal fibrosis, moderate infiltration by mononuclear cells, and small pockets in the subarachnoid space containing polymorphonuclear leukocytes. In view of the clinical data and cerebrospinal fluid alterations, we must assume that



Fig. 5.—Pylephlebitic abscess in liver with thrombotic occlusion of branch of portal vein.

the morphologic picture of purulent meningitis had been altered by antimicrobial therapy. The cerebral vessels showed moderate arteriosclerosis and arteriolosclerosis.

The thyroid was essentially normal. The adrenals were markedly depleted of lipids. The pituitary gland was normal in size and, in one area, showed focal necrosis which is frequently associated with bacterial meningitis.

Pathological Diagnosis.—The pathological diagnosis was cystadenoma of pancreas; chronic relapsing pancreatitis with abscess formation; early peritonitis secondary to extrapancreatic abscess; extreme atrophy of distal portion of pancreas; pylephlebitic abscesses of the liver; and subsiding bacterial meningitis due to enterococcus.

Comment

Non-neoplastic cysts of the pancreas include (1) those due to fibrocystic disease of the pancreas; (2) cysts due to defective development (congenital cysts and cysts due to polycystic disease, with or without association with congenital cysts of the kidney and liver; dermoid cysts; and inclusion cysts from Brunner's glands); (3) retention cysts secondary to obstruction of small or medium-sized pancreatic ducts; (4) pseudocysts, intrapancreatic or peripancreatic (secondary to pancreatitis or trauma); and (5) parasitic cysts. Neoplastic cysts include cystadenoma and cystadenocarcinoma.

In this case, a rare benign tumor of the pancreas, a cystadenoma, occupied the distal part of the head and the greater part of the body of the pancreas. This is a slowly growing tumor which occurs more frequently in females than in males in a ratio of 8:1.³ A review of 10,000 autopsies in Cook County Hospital revealed only two such cases—this in contrast to Priesel's report of an incidence of 9 cases in 9,000 autopsies.⁴ Occasionally the cystadenoma may become malignant. Microscopically, papillary infoldings in the cystic structures of the tumor could be taken as evidence of malignant degeneration. Such infoldings were absent here. Therefore, despite the lack of encapsulation, the tumor in this case is considered to be benign.

This tumor has been associated with diabetes in about 20% of one reported series.⁵ The tumor is usually located in the tail and body of the pancreas.

The location in the central portion of the pancreas is unusual. The stromal calcification of the tumor in this case might have been demonstrated roentgenographically.⁵

In the case under discussion, the diabetes is explained by a combination of chronic, relapsing pancreatitis involving the head of the pancreas, with a silent cystadenoma, which, by virtue of its location, caused an extensive atrophy of the distal portion of the pancreas. The patient developed an acute exacerbation of the chronic pancreatitis which led to peripancreatic abscess, precipitating diabetic coma. The abscess explains the abdominal tenderness and ileus in relation to a focal peritonitis. The peripancreatic abscess, in turn, led to pylephlebitic abscesses, either of which may have resulted in a suppurative meningitis. We have previously observed the combination of relapsing pancreatitis and purulent meningitis caused by a fecal organism (*Aerobacter aerogenes*) as a result of hematogenous spread from pancreatic abscesses. Whenever a patient in diabetic coma develops symptoms of meningitis, this possibility should be considered.

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HYALINE MEMBRANE DISEASE.—The recognition of hyaline membrane disease is . . . of recent origin. It is almost entirely confined to premature infants, is particularly common after caesarean birth, and is usually fatal. The exact cause is not known, but experimental work suggests that oxygen may play an important part. The latest report, from Sweden, by R. Berfenstam and colleagues, suggests that excessive oxygen may act by diminishing the ciliary activity in the bronchial tree and thereby favor the retention of the material forming the hyaline membrane. In rabbits exposed to oxygen in 70-80% concentration for 48 hours the ciliary action was both quantitatively and qualitatively reduced. Berfenstam and colleagues suggest that premature infants, adapted to low oxygen tension in utero, may show evidence of oxygen toxicity at relatively low concentrations in extrauterine life, and they stress the necessity for determining what level of oxygen concentration is safe for such infants in their earliest days after birth. They also found experimentally that excessive oxygen caused vascular damage with increased capillary permeability, and the resulting exudate probably furnished the main part of the hyaline membrane.—Physical Activity and Coronary Disease, Editorial, *British Medical Journal*, Dec. 20, 1958.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE



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GUNNAR GUNDERSEN, M.D.
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ORGANIZATION SECTION

SECTION CENTENNIALS, ATLANTIC CITY MEETING

At the Louisville, Ky., session of the American Medical Association in 1859, six sections of the Association were formed. Some of these sections were eventually combined or divided. The Section on Surgery, General and Abdominal was originally called Section on Surgery. It was given its present name in 1914. The Section on Internal Medicine was first the Section on Practical Medicine and Obstetrics. In 1873 it was split into (1) Section on Practical (Practice of Medicine) Materia Medica and Physiology (the terms Practical Medicine and Practice of Medicine were used interchangeably for many years) and (2) Section on Obstetrics and Diseases of Women and Children. In 1946 it became the Section on Internal Medicine. The Section on Obstetrics and Diseases of Women and Children in 1911 became the Section on Obstetrics and Gynecology.

The Section on Experimental Medicine and Therapeutics started out as the Section on Chemistry and Materia Medica. In 1905 it became the Section on Pharmacology and Therapeutics, and in 1941 it was given its present name. The Section on Pathology and Physiology was originally the Section on Anatomy and Physiology. It was redesignated the Section on Pathology and Physiology in 1901. The Section on Nervous and Mental Diseases was first called the Section on Medical Jurisprudence and Hygiene and received its present name in 1900. All of these section names underwent various changes not listed. The section that underwent the greatest number of changes was the Section on Preventive Medicine. Two sections were formed in 1859, to which the present section is traced.

- 1859 Section on Meteorology, Medical Topography and Epidemic Diseases.
- 1870 Section on Climatology and Epidemics.
- 1871 Section on Meteorology and Epidemics.
- 1859 Section on Medical Jurisprudence and Hygiene.
- 1865 Section on Medical Jurisprudence, Physiology and Hygiene.
- 1872 Section on State Medicine.
(This new Section was combined with the above two sections the next year.)
- 1873 Section on State Medicine and Public Hygiene.
- 1879 Section on Medical Jurisprudence, Chemistry, Psychology, State Medicine and Public Hygiene.
(This terminology was too unwieldy, hence it was shortened the next year.)
- 1880 Section on State Medicine.
(There was controversy over this terminology.)
- 1900 Section on Hygiene and Sanitary Science.
- 1908 Section on Preventive Medicine.
- 1909 Section on Preventive Medicine and Public Health.
- 1922 Section on Preventive and Industrial Medicine and Public Health.
- 1957 Section on Preventive Medicine.

These seven sections of the Scientific Assembly will observe centennials at the Atlantic City meeting, June 8 to 12, 1959, with appropriate ceremonies. Among the guests who have already accepted invitations to the meeting are three from England. Mr. Andrew Claye, president of the Royal College of Obstetricians and Gynecologists, will address the Section on Obstetrics and Gynecology. Dr. J. N. Morris, London Hospital Research Laboratories, will be the centennial guest of the Section on Experimental Medicine and Therapeutics, while Dr. R. R. Coombs, University of Cambridge, will be the guest of the Section on Pathology and Physiology. Other sections are planning features which will be announced soon.

NEW APPOINTMENTS FOR DRS. TURNER AND WIGGINS

Dr. Edward L. Turner was named Director of the new A. M. A. Division of Scientific Activities and Dr. Walter S. Wiggins was named to succeed Dr. Turner as Secretary of the Council on Medical Education and Hospitals. In announcing the staff changes Feb. 10, Dr. F. J. L. Blasingame, Executive Vice-President, noted that the new Division includes the Councils on Mental Health, Scientific Assembly, and Medical Education and Hospitals; the American Medical Education Foundation; and the Department of Therapy and Research.

Prior to joining the A. M. A. Council staff in 1953, Dr. Turner was dean of the University of Washington School of Medicine, Seattle, which he helped organize after leaving a private practice in Bradford, Pa. He also served as president of Meharry Medical College at Nashville, Tenn. (of which he is still a trustee), and was a professor of physiology and head of the department of medicine at the American University of Beirut in Lebanon. Currently he is Secretary of the American Medical Education Foundation, consultant or advisor to a number of governmental and philanthropic organizations concerned with health and medical education, associate trustee of the University of Pennsylvania, a director of the National Internship Matching Program, and on the planning committee of the Second World Conference on Medical Education.

Dr. Wiggins joined the Council on Medical Education and Hospitals as Associate Secretary in 1954. Previously he had been assistant dean, State University of New York College of Medicine at Syracuse, director of the Syracuse Medical Center Tumor Clinic, and instructor and assistant professor of medicine at the Syracuse University College of Medicine.

MEDICAL NEWS

COLORADO

Students Receive Scholastic Awards.—Fifteen University of Colorado School of Medicine students received awards for scholastic excellence at an honor convocation Jan. 22 on the Medical Center campus, Denver. Dean Robert J. Glaser presided. The awards were made by members of the School of Medicine faculty representing the various categories involved. The convocation was combined with the annual lecture sponsored by Alpha Omega Alpha, honorary medical fraternity, and the speaker was Dr. Robert A. Moore whose subject was "Devotion to Excellence." Dr. Moore is president of the New York University's Downstate Medical Center and is dean of its medical school. These students received awards:

Noel C. Sorrell, Albuquerque, N. M.; Arnold Silverman, Bronx, N. Y.; John Moxley, Denver; Gerald Mayfield, Las Cruces, N. M.; Thomas J. Campbell, Grand Junction; Lawrence McKinnis, Boulder; Neil Rigenbach, Monte Vista; Donald J. Stouder, Englewood; Robert W. Thompson, Lander, Wyo.; William Droege Mueller, Kersey; Hillmer A. Fonken, Ft. Collins; Jo Anne Brasel, Boulder; Eveline E. Schneeberger, Denver; Watson Bowes Jr., Denver; and David L. Bowerman, Victor, N. Y.

The awards are all monetary, in varying sums, and some apply on tuition.

Russian Surgeons Visit Denver.—Three of Russia's outstanding academic surgeons were guests of their U. S. counterparts in Denver during the 20th annual meeting of the Society of University Surgeons, Feb. 12-14. Arrangements for the visitation were completed as part of the U. S.-U. S. S. R. exchange agreement of medical lecturers between the two countries. The Russian visitors are: Dr. Boris Petroff, professor and chief surgeon, the Sklifosowsky Institute, Moscow; Dr. Fedor Uglov, professor and chief surgeon, First Medical Service, Leningrad; Dr. Boris Ositov, professor and chief surgeon, Institute of Postgraduate Study, Moscow. Accompanying the Russian surgeons on their trip from New York was Dr. Henry T. Randall, chairman, department of surgery, Memorial Hospital, New York City, and president-elect of the Society of University Surgeons. The Russian surgeons also visited other U. S. medical institutions, where they delivered lectures, including Baylor University Medical School, Houston, Texas; University of Minne-

sota, Minneapolis; Mayo Clinic, Rochester, Minn.; Western Reserve University, Cleveland; the National Institutes of Health, Washington, D. C.; and the Johns Hopkins University, Baltimore.

ILLINOIS

Quincy Physicians Aid Education.—The Swanberg Kiwanis Foundation, joint sponsor with the Kiwanis Club of Quincy of the Quincy Major Learning Program, has received the 1958 B. V. D. Community School Improvement Award for the East Central Region of the United States. These awards are presented annually by the B. V. D. Co., of New York. The Quincy Major Learning Program was declared by the judges to be "the most outstanding citizens' effort for the betterment of community schools in the nine-state region of Alabama, Illinois, Indiana, Kentucky, Michigan, Mississippi, Ohio, Tennessee, and Wisconsin, for 1958." The award was presented Jan. 19. The Quincy program, initiated by the Swanberg Kiwanis Foundation of the Kiwanis Club of Quincy in 1956, is devoted "to early identification of the superior and talented students in the high schools of Quincy and Adams County and their guidance and motivation to seek a college education." Last year the Kiwanians induced the Quincy and Adams County physicians, through the Adams County Medical Society and the Swanberg Medical Foundation, to establish Academic Scholarship Achievement Awards whereby "talented high school seniors are recognized for scholarship achievement, especially in academic subjects."

Chicago

Clinical Meeting.—The annual Clinical Conference of the Chicago Medical Society will be held at the Palmer House, March 2-5. Thirty-three half-hour lectures, a panel discussion, a clinical-pathological conference, and medical color telecasts are planned. Out-of-state participants include the following physicians:

Edwin H. Ellison, Milwaukee; Edward C. Mann, William T. Foley, and Robert H. Kennedy, New York City; John C. McClintock, Albany, N. Y.; E. V. Allen, Rochester, Minn.; Schuyler C. Kohl, Brooklyn; Julius L. Wilson, Philadelphia; William R. Sandusky, Charlottesville, Va.; John H. Ebersole, Waterford, Conn.; J. Walter Wilson and A. Estin Comarr, Los Angeles; John R. Haserick, Cleveland; Russell S. Fisher, Baltimore; John P. McGovern, Houston, Texas; Ted F. Leigh, Atlanta, Ga.; Norman F. Miller, Ann Arbor, Mich.; David M. Hume, Richmond, Va.; and Stewart Wolf, Oklahoma City, Okla.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

A trauma demonstration, instructional courses, and scientific and technical exhibits are arranged. For information write the Chicago Medical Society, 86 E. Randolph St., Chicago 1.

Personal.—Dr. Edward F. Lis, director of the Center for Handicapped Children at the University of Illinois Hospital, has been appointed acting director of the university's state-wide division of services for crippled children. The appointment fills the vacancy created Jan. 10 by the death of Dr. Herbert R. Kobes, division director in Springfield.—Dr. Eleanor M. Humphreys, who has been associated with the department of pathology, University of Chicago, since 1926, has been made professor emeritus and consultant. For 11 years prior to retirement Dr. Humphreys was in charge of surgical pathology. The American Medical Women's Association honored Dr. Humphreys as the "Woman of the Year" for 1958.—Dr. Ernst T. Mörch, professor of surgery and director of the section on anesthesiology at the University of Chicago for the past six years, has been made chief and professor of anesthesiology at Cook County Hospital, Chicago, effective Dec. 1. Dr. Mörch, who received the degree of doctor of medicine in 1935 and the degree of doctor of philosophy in 1942 both from the University of Copenhagen, received post-graduate medical training in surgery in Denmark 1935-46.

KENTUCKY

County Officers Conference.—Third-party medicine will be the topic highlighted at the ninth annual County Society Officers Conference of the Kentucky State Medical Association in Lexington March 26. Mr. Hugh Brennehan, Lansing, public relations counsel for the Michigan State Medical Society, will moderate a panel on problems developing in the third-party field. Panelists will include Dr. Ernest B. Howard, Chicago, Assistant Executive Vice-President of the American Medical Association; Leslie Hodson, Chicago, legal counsel for the A. M. A.; and Dr. Donald Cass, Hollywood, delegate to the A. M. A. from California. Luncheon speaker will be Dr. Russell B. Roth, Erie, vice-chairman, board of trustees, Medical Society of the State of Pennsylvania.

MASSACHUSETTS

School Health Conference.—The Massachusetts Conference on School Health will be held at the Statler Hilton, Boston, March 18. Dr. Charles C. Lund, president, Massachusetts Medical Society, will open the meeting followed by a talk by Dr. Thomas F. Reilly, chairman, Committee on School Health, Massachusetts Medical Society. The program includes the following:

Necessary Elements for Health Evaluation of Children, Dr. Maurice M. Osborne, Jr., director of child health, Brookline Health Department.

A Program of Physical Education, Mr. Reagh C. Wetmore, head, department of physical education, Phillips Andover Academy.

Recognizing the Orthodontic Problem, Milton J. Meyers, D.M.D., instructor, Tufts University Dental School.

Two panels are planned: "Eye Problems in the School Child," with Drs. Richard B. Pippitt, Thomas Cavanaugh, and Thomas P. Cronin Jr., and "Emotional Disturbances," with Dr. Richmond Holder, Dr. John A. Davies, and Mr. Charles K. Cummings, director of guidance, Weston Public Schools.

MISSOURI

Hospital Alumni Meeting.—The St. Louis City Hospital Alumni Association will hold its 71st annual meeting Monday, March 9, at the Le Chateau Restaurant, 10405 Clayton Road, St. Louis County. The American College of Surgeons will be meeting in St. Louis at the same time, and the alumni of the hospital will be able to attend this annual dinner party. For information write Dr. Shale M. Rifkin, Suite 830, 3720 Washington Blvd., St. Louis 8.

NEBRASKA

Physicians Meeting in Omaha.—The 13th annual regional meeting of the American College of Physicians for Nebraska will be held March 7 at the Sheraton-Fontenelle Hotel, Omaha. The program includes the following papers:

Macroglobulinemia: A Case Under Study for Three Years, Dr. John C. Thompson, Lincoln.

Refractory Anemia Responding to Androgen Therapy, Dr. Henry J. Lehnhoff Jr., Omaha.

New Ideas for Cardiac Exercise Tests, Dr. F. Lowell Dunn, Omaha.

Ammonia Metabolism in Hepatic Coma, Dr. Joseph M. Holthaus, Anthony J. Barack, Ph.D., and Fred L. Humoller, Ph.D., Omaha.

Whipple's Disease: A Case Report with Unreported Findings, Drs. Robert A. Youngman and Edward D. Zeman, Lincoln.

Dr. Dwight L. Wilbur, San Francisco, president, American College of Physicians, will present "Some Considerations of Functional Gastrointestinal Disorders" at 3:45 p. m. and will speak on "The Third Person in Medicine" at the banquet 6:30 p. m. For information write Dr. Edmond M. Walsh, 5002 Dodge St., Omaha.

NEW JERSEY

Dr. Nenno Named Department Director.—The appointment of Dr. Robert P. Nenno as professor and director, department of psychiatry, Seton Hall College of Medicine and Dentistry, has been announced. In 1953-1957, Dr. Nenno was assistant professor and assistant director of the department of psychiatry, Georgetown University School of Medicine, Washington, D. C. He has served as

consultant at Georgetown University Hospital, where he initiated the retarded children's clinic. Dr. Nenno is a diplomate of the National Board of Medical Examiners and the American Board of Psychiatry and Neurology.

Conference on Child Amputees.—In conjunction with the 10th anniversary of the Kessler Institute for Rehabilitation, the biannual Congenital Child Amputee Conference and Clinic will take place at West Orange, N. J., May 2. After the 9 a. m. registration, the morning program will consist of an educational and orientation session. Dr. Henry H. Kessler, medical director, will discuss "Congenital Malformations and General Principles of Rehabilitation of the Congenital Amputee." Demonstrations will be given of treatment techniques and prosthetic devices employed in rehabilitation of upper and lower extremity child congenital amputations. Documentary films of rehabilitation procedures used in specific cases will be shown. Clinical examinations will be held in the afternoon. This free diagnostic service is available to congenital amputee children through medical referral. The conference is open to physicians, nurses, limb makers, therapists, and other rehabilitation personnel without charge. Advance registration is requested with Mrs. Lucile Gould, Kessler Institute for Rehabilitation, West Orange, N. J.

NEW YORK

Dr. Witebsky Named Dean in Buffalo.—The University of Buffalo has named Dr. Ernest Witebsky as the new dean of its School of Medicine. Dr. Witebsky has served as acting dean of the medical school since the death last February of the former dean, Dr. Stockton Kimball. He is also professor and head of the department of bacteriology and immunology. Dr. Witebsky received special honors for his research last June from the University of Freiburg, Germany. He holds an M.D. degree from the University of Heidelberg and was a member of the faculty of that university from 1929 to 1933. Dr. Witebsky, one of the original organizers and chairman of the International Society of the Hematology Program in Buffalo in 1948, is a bacteriologist and serologist at the Buffalo General Hospital.

New York City

Lecture on Trigeminal Neuralgia.—Dr. Francis C. Grant, emeritus professor of neurological surgery, University of Pennsylvania School of Medicine, will present the Charles A. Elsberg Lecture May 19th, 8:30 p. m., at the New York Academy of Medicine, 2 E. 103rd St. Dr. Grant has chosen for his subject "Trigeminal Neuralgia."

Personal.—Dr. Saul S. Samuels has been elected founding president of the International College of Angiology.—Dr. Samuel A. Thompson, appointed

to the staff of New York Medical College in 1923 as instructor in surgery and named associate professor of surgery in 1938, has been appointed chief of the section of thoracic surgery at New York Medical College, Flower and Fifth Avenue Hospitals.

Train Hospital Personnel to Fight Fires.—A fire-fighting training program given to hospital employees is presently being conducted by the Jewish Chronic Disease Hospital, Brooklyn. Inaugurated in July under the direction of Mr. Eddy Charles, the hospital's director of building services, 30 hospital employees at a time are given complete training in the fighting of fires at the hospital. The program includes actual demonstrations with fire and fire-fighting apparatus used in extinguishing fires. This includes asbestos blankets, fire extinguishers, carbon dioxide, soda and acid. At each monthly session, participants show what they have learned by participating in fire extinguishing. Discussions and training on fire prevention with specific demonstrations with various types of equipment are carried on by Mr. Charles. Each new employee takes the course within one month after joining the hospital staff. More than 200 members of the hospital's staff have received training in this program.

Dr. Stone Takes World Tour.—Dr. Abraham Stone, director of the Margaret Sanger Research Bureau, 17 W. 16th St., left Feb. 6 on a trip around the world in connection with the problems of population and family planning. Dr. Stone flew to New Delhi, India, to take part in the seventh International Conference of the International Planned Parenthood Federation, of which he is a vice-president. He visited Moscow en route to New Delhi. At the close of the conference, he will remain in India at the invitation of the Indian Health Service, spending three or four weeks observing and studying the work of the Indian planned parenthood programs and consulting with health officers and clinicians. Dr. Stone was also invited by the Family Planning Association of Pakistan to participate in a seminar and to hold training seminars in Dacca and Lahore. In West Pakistan, he will be a guest of the Ministry of Health. During his return trip to the United States, Dr. Stone plans to stop at Taiwan, in the Philippines, and in Japan.

PENNSYLVANIA

Conference on Experimental Psychiatry.—On March 5, 6, and 7, the Western Psychiatric Institute and Clinic will sponsor a Conference on Experimental Psychiatry as part of Pittsburgh's year-long bicentennial celebration. The following men will participate: Dr. John D. Benjamin, Ray L. Birdwhistell, Ph.D., Dr. Jack R. Ewalt, Dr. Robert H. Felix,

Dr. Ralph W. Gerard, Dr. Francis J. Gerty, Dr. Roy R. Grinker, Ernest R. Hilgard, Ph.D., Heinrich Klüver, Ph.D., Dr. Lawrence S. Kubie, Dr. Alexander H. Leighton, Dr. William Malamud, Dr. Amedeo S. Marrazzi, Dr. Warren S. McCulloch, and Robert A. Patton, Ph.D. For information write Dr. Henry W. Brosin, Director, Department of Psychiatry, University of Pittsburgh School of Medicine, 3811 O'Hara St., Pittsburgh 13.

Philadelphia

Conference on Gerontology.—The research facility and medical staff of the Home for the Jewish Aged, Philadelphia, for the past three years have been holding monthly conferences in Gerontology. On April 12, 10 a. m., Dr. Werner Henle, professor of virology, University of Pennsylvania School of Medicine, will present "Respiratory Viruses in the Geriatric Patient."

TEXAS

Neurological Meeting in Houston.—The Houston Neurological Society is having its seventh annual scientific symposium meeting March 12-14 in the auditorium of the Jesse Jones Library Building in the Texas Medical Center, Houston, with registration beginning at 8 a. m., March 12. The annual banquet will be at 6:45 p. m., March 13, in the Emerald Room of the Shamrock-Hilton Hotel, with Charles M. Pomerat, Ph.D., professor of cytology, University of Texas Medical Branch, Galveston, as guest speaker. His subject will be "The Mediterranean—Source of Cultural Inspiration." The scientific program will be a symposium: "Pathogenesis and Treatment of Cerebrovascular Disease," to extend over three days and consist of the following parts: "Anatomy," "Occlusive Disease," and "Intracranial Hemorrhage." There will be 20 participants on the program, and the symposium moderator will be Dr. William S. Fields, chairman, department of neurology, Baylor University College of Medicine. Registration fee is \$5. Physicians and others interested in basic neurologic sciences are cordially invited. For information, write Dr. Claude Pollard Jr., Secretary-Treasurer, Houston Neurological Society, 437 Hermann Professional Bldg., Houston, Texas.

WEST VIRGINIA

Research Foundation Acquires Kanawha Hospital.—Dr. Gustavus B. Capito, of Charleston, has turned over to the Charleston Foundation for Medical Research and Education 60% of the stock of the Kanawha Valley Hospital and Kanawha Valley Hospital Building Association. The board of trustees of the recently organized foundation includes John M. and Charles Capito, nephews of Dr. Capito; an accountant; a bank president; and two attorneys, all of Charleston. Dr. Capito an-

nounced recently that the Kanawha Valley Hospital would become a nonprofit institution after nearly 50 years of operation as a privately owned stock corporation. Stockholders will receive the appraised value of their stock from future profits. The value of the stock turned over by Dr. Capito to the foundation was not announced; however, the fund will be held in trust and the income from it applied by the trustees to fulfill the purposes of the foundation. Dr. Capito has indicated that in the field of research to be undertaken by the foundation, due consideration be given to the new four-year school of medicine at West Virginia University. He has requested that at the present time local benefits be given priority, particularly research into aid for the medically indigent. A trust agreement between Dr. Capito and the trustees states that the purpose of the foundation will be "to conduct research in the fields of medicine, science, education and related subjects." Dr. Capito, who celebrated his 81st birthday Jan. 25, will remain as hospital counselor without compensation. He formerly served as president and medical director.

GENERAL

New England Allergists Meet in Boston.—On March 25 the New England Society of Allergy will hold its annual meeting in Boston. Sessions will be held at Longwood Towers. The program committee has announced that it will consider papers for presentation submitted by members of the society. The business meeting is planned for 7:30 p. m. For information write the New England Society of Allergy, 300 Longwood Ave., Boston.

Invite Requests for Eye Research Grants.—The Research Committee of the National Society for the Prevention of Blindness invites requests for research grants in 1959. Funds are available for projects that may contribute to basic understanding of eye function and pathology, or that may improve methods of diagnosis, treatment, or prevention of blinding eye disease. Grants will be made this spring for requests received prior to May 1, and inquiries may be addressed to Research Committee, National Society for the Prevention of Blindness, 1790 Broadway, New York 19.

Symposium on the Malabsorption Syndrome.—The National Vitamin Foundation will present a symposium on Absorption Mechanisms and the Malabsorption Syndrome March 3 at the Sheraton-East Hotel, New York City. The two sessions "Absorption Mechanisms" and "The Malabsorption Syndrome in Man," will have Drs. D. Mark Hegsted, Boston, and David Adlersberg, New York City, as chairman. A panel discussion will be conducted at 3:30 p. m. Dr. Norman Jolliffe, Director of the Bureau of Nutrition, Department of Health of the

City of New York, will speak on "The Anti-Corony Club" at the dinner 7:30 p. m. For information write the National Vitamin Foundation, 149 East 78th St., New York 21, N. Y.

Caribbean Medical Cruise.—A 12½-day scientific program cruise, sponsored by the New York State Academy of General Practice, is planned for Oct. 22 to Nov. 4 on the M. S. Kungsholm of the Swedish American Line. There will be stop-overs at St. John and St. Thomas in the Virgin Islands; San Juan, Puerto Rico; Cap Hitien, Haiti; Havana, Cuba. A deposit of \$50 will hold a reservation on any stateroom until April 1 at which time a deposit of 25% of the passage money will be required. The balance must be paid by Sept. 1. Prices will range from \$330 and up depending on the location of the stateroom. Cruise membership will be limited to 425 persons. For information write Dr. Seymour Fiske, chairman of the cruise committee, 150 East 71 St., New York 21.

Request Residency Posts for Indian Physicians.—The Indian Medical Association requests offers from recognized hospitals for residency posts in all specialties for doctors from India—men and women—specially selected for graduate training in U. S. hospitals for the session commencing July 1. These doctors will have a good command of English, spoken and written. The hospitals must be approved by the U. S. State Department for Exchange-Visitor Program. This request of the Indian Medical Association has the approval of the American Medical Association. Interested hospitals are requested to communicate direct, by air mail, to the Honorary Secretary, Indian Medical Association, "Hanging Bridge," Daryaganj, Delhi-7, India, giving offers of posts, terms of appointment, etc., including maintenance, stipend, and the allotted number for Exchange-Visitor Program.

Meeting on Nuclear Medicine.—The sixth annual meeting of The Society of Nuclear Medicine will be held at the Palmer House, Chicago, June 18-20. Members of the society and guests desirous of participating in the scientific program should submit titles and abstracts, of no more than 250 words, to Dr. Donald W. Petit, Program Chairman, University of Southern California, School of Medicine, 1200 N. State St., Los Angeles 33, no later than March 1. Members and guests who wish to prepare a scientific exhibit should prepare a report of about 500 words explaining the purpose of the scientific exhibit as well as a brief description of the exhibit layout. Exact dimensions and other pertinent details should be forwarded to Dr. Murray E. Volk, Chairman, Committee on Scientific Exhibits, 5412 N. Clark, Chicago, together with the report.

Establish Fred L. Soper Lectures.—The Pan American Sanitary Bureau staff honored its director of 12 years on his retirement Feb. 1 with the establishment of the Fred L. Soper Lectures in International Health. The series will include five lectures to be given by outstanding medical personalities on successive years at leading schools of Public Health in the United States, Brazil, Chile, Mexico, and Canada. The first lecture will be given this fall by Dr. Soper himself at Johns Hopkins University's School of Hygiene, Baltimore. Bureau staff members will finance the lectures by voluntary donations to a special fund. Lecturers will be chosen by the host university and a committee of the PASB staff. Object of the series is "to bring Public Health students throughout the Americas into contact with scientific health authorities as outstanding as Dr. Soper."

Physicians in Congress.—Physician members of the 86th Congress number four, one less than the last Congress. November elections bring back Drs. Walter Judd, of Minnesota, Thomas Morgan and Ivor Fenton, both of Pennsylvania, and Dr. Thomas Alford, of Arkansas. Defeated at the polls were Drs. Will Neal, of West Virginia, and A. L. Miller, of Nebraska. Dr. Neal has been active on the health subcommittee of the House Interstate Committee and Dr. Miller on District of Columbia and Interior and Insular Affairs committees. Dr. Alford, a board ophthalmologist of Little Rock, ran for public office for the first time. He has been practicing in Little Rock since 1948. Dr. Morgan is scheduled to take over the chairmanship of the House Foreign Affairs Committee on which Dr. Judd also serves. Dr. Morgan would become the first physician to head that committee in its 136 years.

Annual Meeting of Laryngologists.—The 80th annual meeting of the American Laryngological Association will be held March 8-9 at the Homestead, Hot Springs, Va. Dr. Fred W. Dixon, Cleveland, president of the association, will open the meeting. The following will be presented by invited speakers:

Carcinoma of the Nasopharynx, An Analysis of Thirty-Three Cases, Dr. L. Q. Pang, Honolulu, Hawaii.

Diagnosis of Chronic Inflammatory Lesions of the Sphenoid, Drs. James H. Maxwell and B. Jay Hill, Ann Arbor, Mich.

Cystic Fibrosis of the Pancreas and Nasal Mucosa, Dr. Moses Lurie, Boston.

A Histo-Chemical Study of the Pathogenesis of Nasal Polyps, Dr. Alexander Weisskopf, San Mateo, Calif.

Wegener's Granuloma, Drs. Joseph P. Atkins and Sylvan Eisman, Philadelphia.

Discussions will follow each presentation. The annual dinner will be held the evening of March 8. For information write Dr. James H. Maxwell, Out-Patient Bldg., University Hospital, Ann Arbor, Mich., Secretary.

Student Fellowships in Allergy.—The Scientific and Educational Council of the Allergy Foundation of America has announced the availability of a limited number of quarterly or summer scholarships at \$500 each in approved medical schools in the United States and Canada. These scholarships are available to students who have creditably completed their second or third year in medical school, and are to be for a minimum of eight weeks of training in clinical and research allergy. Each medical school has been invited to submit the name of one applicant through the dean's office with a letter from the dean in support of the candidate's application, outlining the candidate's medical school record, the proposed research project, and under whose sponsorship it will be carried out. Direct applications from students will not be considered. All applications must be filed no later than March 1 and should be sent to Dr. Robert A. Cooke, chairman, Scientific & Educational Council, Allergy Foundation of America, 801 Second Avenue, New York 17.

Congress of Surgeons in Miami Beach.—The South-eastern Surgical Congress will hold its 27th annual assembly March 9-12 at the Deauville Hotel, Miami Beach. The presidential address will be given by Dr. Murray M. Copeland, Washington, D. C., director, department of oncology, Georgetown University Medical Center. The following will be presented by guest speakers:

Dissemination of Cancer and Its Prevention, Dr. Warren H. Cole, Chicago.
 Management of Adrenal Hyperfunction, Dr. Olaf H. Pearson, New York City.
 Advantage of Supervoltage X-ray Techniques to Surgeons in Diagnostic Radiology, Dr. Eugene P. Pendergrass, Philadelphia.
 The Relationship Between Breast Cancer and Benign Breast Disease, Dr. Edward F. Lewison, Baltimore.
 An Evaluation of Hemipelvectomy, Dr. Mark M. Ravitch, Baltimore.
 Advances Made in Cancer Research, Dr. J. R. Heller, Bethesda, Md.
 Bone Tumors, Dr. Charles F. Geschickter, Washington, D. C.
 Plastic Surgical Principles in Farm, Industrial and Traffic Accidents, Dr. J. Barrett Brown, St. Louis.

Three panel discussions are planned: "Treatment of Advanced Cancer of the Breast," "Gynecology," and "Trauma." For information write Dr. B. T. Beasley, Secretary-Director General, The South-eastern Surgical Congress, 1032 Hurt Building, Atlanta 3, Ga.

Fellowship for Study on Pituitary Irradiation.—Donner Laboratory at the University of California, Berkeley, has announced the offering of a fellowship or training opportunity in connection with its pituitary irradiation studies. This program utilizes a high-energy particle beam for the study and investigation of the effects of pituitary irradiation on various conditions, including metastatic breast

carcinoma, advanced diabetes mellitus with retinopathy, acromegaly, and pituitary tumors. Activities of the fellow will include participation in the irradiation program, in-patient and out-patient care, and extensive metabolic-endocrinological studies. Included will be training in the use of isotopes in research, investigation, diagnosis, and therapy. The fellowship will commence July 1, for one year, with the possibility of extension for an additional year. Interested physicians with residency training in metabolism-endocrinology, radiology, or hematology should write to Dr. John H. Lawrence, Director, Donner Laboratory, University of California, Berkeley 4, Calif. Inquiries should be accompanied by a complete curriculum vitae.

Surgeons Hold Sectional Meeting in St. Louis.—A comprehensive sectional meeting of the American College of Surgeons will be held in St. Louis, March 9-12. Headquarters will be the Kiel Auditorium, with many sessions scheduled also in St. Louis hospitals. The program will include hospital clinics, panel discussions, symposiums, scientific papers, technical exhibits, medical motion pictures, and cine clinics in general surgery and in the specialties of thoracic surgery, urology, gynecology and obstetrics, ophthalmic surgery, and orthopedic surgery. Dr. Frank McDowell, St. Louis, associate clinical professor of surgery, Washington University School of Medicine, is chairman of the local advisory committee on arrangements for the scientific program. The joint nurses program, now an annual feature of this four-day meeting, will include discussions on comprehensive care of the patient who has successfully undergone pelvic evisceration, open technique in the management of burns, congenital heart disease, and other problems. Tours and demonstrations will be held at Barnes Hospital, Cardinal Glennon Children's Hospital, Central Institute for the Deaf, Cochran Veterans Hospital, Firmin Desloge Hospital, Jewish Hospital, Missouri School for the Blind, St. Anthony's Hospital (Poliomyelitis Center), St. Louis Children's Hospital, St. Louis City Hospital, St. Luke's Hospital, and Shriners' Hospital for Crippled Children. Dr. H. Prather Saunders, associate director, American College of Surgeons, is in charge of the sectional meeting program for the college.

FOREIGN

Symposium on Toxic Substances in Prague.—The International Symposium on Maximum Allowable Concentrations of Toxic Substances in Industry will be held at Prague, April 14-17. The symposium will be arranged under the aegis of the Permanent Committee and International Association on Occupational Health and the International Union of Pure and Applied Chemistry. The following subjects will be treated:

1. The investigation of present-time definitions and conceptions of maximum allowable concentrations in different countries.
2. The evaluation of present-time methods and procedures used in different countries for the determination and fixing of maximum allowable concentrations.
3. Maximum allowable concentrations in biological materials.
4. The evaluation of the importance of suitable methods of chemical analyses, physical methods and methods of sampling used in industry.
5. General discussion.

President of the Organizing Committee is Prof. Rene Truhaut, Paris, and General Secretary is Prof. Jar. Teisinger, Prague II., Karlovo n.33 (Czechoslovakia).

CORRECTION

Dr. Rosenbaum at Washington University.—In the article by Dr. Eva F. Dodge et al. on "Late Sequelae of Saddle Block Anesthesia in Obstetrics" in THE JOURNAL, Jan. 31, 1959, page 430, second column, fourth line in the second paragraph, the authors stated that "Rosenbaum and co-workers at St. Louis University, in 1952, reported 6 cases. . . ." Dr. Rosenbaum writes that he and his co-workers were all affiliated with Washington University and not St. Louis University.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: *Oral*. Phoenix, April 5-10. Final date for filing application is file. Sec., Dr. Forrest E. Ave., Hartford 5, Conn.

AMERICAN BOARD OF DERMATOLOGY: *Written*. Several Cities, Oct. 5. *Oral*. Oklahoma City, Jan. 15-18, 1960. The final date for filing all applications is July 1, 1959. Sec., Dr. Beatrice M. Kesten, One Haven Ave., New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: 1959 Schedule—*Written*, Oct. 19. Final date for filing application is May 1. *Oral*. For candidates in the Midwest. Chicago, April 15-18. Final date for filing application was Jan. 1. *Oral*. For candidates on the West Coast. Final date for filing application is March 1. *Oral*. For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology*. Philadelphia, April 17-18. Final date for filing application was Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *I. Oral and Clinical*. Chicago, May 8-19. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates. Candidates who partici-

pated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible. Deadline for receipt of new and reopened application for the 1960 examinations is Aug. 1, 1959. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral*. (Part II) Philadelphia, June 2-6; St. Louis, Oct. 6-10. *Written* (Part I), Jan. 25, 1960. Application for 1960 must be filed before July 1, 1959. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part I*. Washington, D. C., Denver, Colorado and Rochester, Minn., Mar. 26-27. Deadline for filing application was Nov. 30. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral*. Chicago, Oct. 5-9. Final date for filing application is February. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PATHOLOGY: Boston, April 16-19. Final date for filing application is Feb. 28. Sec., Dr. Edward B. Smith, 1100 W. Michigan St., Indianapolis 7.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Written, Part I, and Oral, Part II*. Philadelphia, June 12-13. Final date for filing application is February 15. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral and Written*. Miami, Fla., Oct. 15-17. Final date for submitting case reports is July 1. Corresponding Secretary, Miss Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8, Mo.

AMERICAN BOARD OF PREVENTIVE MEDICINE: *Written. Public Health. Regional*, Apr. 9-11. *Occupational Medicine*. Chicago, Apr. 17-19. *Aviation Medicine*. Los Angeles, Apr. 24-26. Final date for filing application for all three examinations is Jan. 15. Sec., Dr. Tom F. Whayne, 3438 Walnut St., Philadelphia 4.

AMERICAN BOARD OF PROCTOLOGY: *Oral and Written*. Philadelphia, September. Final date for filing application is March. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New Orleans, Mar. 16-17; Chicago, Oct. 19-20; New York, Dec. 14-15. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 was terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: *Special Examination*. Cincinnati, Mar. 16-19, 1959. Final date for filing application was Nov. 1. *Examination*. Chicago, June 2-4. If needed a special examination will be offered at this time in Nuclear Medicine to diplomates in Radiology or Therapeutic Radiology. The deadline for filing applications is April 1. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written* examinations (Part I) will be held on December 2, 1959 at various centers to be announced later. Candidates are urged to apply several months before completion of training requirements although the closing date for filing applications is August 1. Those completing training requirements after September 30 cannot be considered for the Part I examination in December of the same year. *Part II*. Durham, No. Car., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

BOARD OF THORACIC SURGERY: *Oral*. Los Angeles, September. Final date for filing application is July 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

AMERICAN BOARD OF UROLOGY: The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

GOVERNMENT SERVICES

NAVY

Medical Military Training.—A two-week course in Medical Military Training beginning March 9, 1959, will convene at the Naval Medical School, National Naval Medical Center, Bethesda, Md. The first week will be devoted to medical aspects of special weapons and radioactive isotopes with particular reference to personnel casualties from atomic explosions. The second week will be devoted to professional topics of concern to military medicine, including discussions on reserve medical programs of the Armed Forces. As this course has new subjects, new material, and has been revised to bring it up to date, it is highly recommended for officers to repeat this training in the event they have participated in previous classes. Naval Reserve Medical Department Officer personnel from the First, Third, Fourth, Sixth, Eighth, and Ninth Naval Districts may attend on a limited quota basis. No security clearance is required.

VETERANS ADMINISTRATION

Vocational Rehabilitation.—In order to facilitate the rehabilitation of disabled veterans, they are now allowed to begin vocational training while they still are patients in VA hospitals. They must, however, be far enough along in their hospital treatment to be able to leave the hospital part of the day to attend school or a training establishment. Another new feature permits veterans to start vocational rehabilitation training even if they cannot be expected to complete it by the termination date for such training as established by law. In such cases, however, arrangements must be made for some agency other than the VA—such as a State Rehabilitation Agency—to pick up where the VA has to leave off. The termination date for disabled veterans of the Korean conflict who left the service before Aug. 20, 1954, is Aug. 20, 1963. The date for those who left the service after Aug. 20, 1954, is nine years from separation or Jan. 31, 1964, whichever comes first. In some instances, these dates can be extended. Only a few World War II disabled still are eligible for vocational rehabilitation, and their termination date is July 25, 1960. A third new feature permits the VA to give placement assistance as well as personal counseling to disabled veterans after they have completed their vocational training if needed. Previously, VA counseling was given only before a veteran started his training or while he was in training.

PUBLIC HEALTH SERVICE

Regular Corps Examinations for Medical Officers.—A competitive examination for appointment of medical officers to the Regular Corps of the United States Public Health Service will be held in various places throughout the country on April 21, 22, 23, and 24, 1959. Appointments provide opportunities for career service in clinical medicine, research, and public health. They will be made in the ranks of assistant and senior assistant surgeons, equivalent to Navy ranks of lieutenant (j. g.) and lieutenant respectively. Entrance pay for assistant and senior assistant surgeons with dependents is \$7,470 (assistant grade applicants are assigned the temporary grade of senior assistant). Provisions are made for promotions at regular intervals.

Benefits include periodic pay increases, 30 days annual leave, sick leave, medical care, retirement for age or disability, retirement pay which is 75% of annual basic pay at time of retirement, and other privileges. Active duty as a Public Health Service officer fulfills the obligation of Selective Service. Requirements are United States citizenship, age of at least 21 years, and graduation from a recognized school of medicine. For the rank of assistant surgeon and for senior assistant surgeon at least 7 and 10 years, respectively, of collegiate and professional training and appropriate experience is needed. Entrance examinations will include an oral interview, physical examination, and comprehensive objective examinations in the professional field. Application forms may be obtained by writing to the Surgeon General, Public Health Service (P), Washington 25, D. C. Completed application forms must be received in the Division of Personnel no later than March 6, 1959.

Influenza Epidemic.—Surgeon General Burney of the Public Health Service alerted state and territorial health officers to the increase in reports of outbreaks of various types of influenza in several European countries. Although no outbreak in the United States has been reported, the disease may be introduced into this country by persons entering or returning from Europe. Health officers are urged to report promptly any laboratory confirmed cases. *The British press on Feb. 6 stated that a wave of influenza was swamping the hospitals in England.* Type A influenza is also reported to affect large numbers of persons in the U. S. S. R. Type B has been identified in Italy and the Netherlands. Practicing physicians are urged to vaccinate such groups as the aged, the chronically ill, pregnant women, hospital staff personnel, and others whose incapacitation by illness would disrupt essential services.

DEATHS

Albee, George Cummings, Berkeley, Calif.; Medical Department of the University of California, San Francisco, 1905; veteran of World War I; died in the Herrick Memorial Hospital Dec. 5, aged 81.

Aldrich, Hattie Bassett, Caney, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1904; died Dec. 8, aged 89.

Allen, Daisy Emery ® Fort Worth, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1897; at one time professor of pediatrics at the Dallas Medical College; died Dec. 7, aged 82.

Allen, Duff Shederic, St. Louis; Washington University School of Medicine, St. Louis, 1919; formerly on the faculty of his alma mater; member of founders group of the American Board of Surgery; appointed a member of the state board of medical examiners in 1953 and later became chairman; member of the Missouri State Medical Association, Society of University Surgeons, and the American Association for Thoracic Surgery; associated with St. Louis Children's and St. Louis Maternity hospitals; served as associate editor of *Journal of Thoracic Surgery*; died in St. John's Hospital Dec. 7, aged 63.

Aron, Hans Carl Siegfried ® Chicago; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1908; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; served on the faculty of Northwestern University Medical School; at one time on the faculty of the University of the Philippines College of Medicine in Manila; associated with the Children's Memorial Hospital; died Dec. 11, aged 77.

Bishop, Henry Hawkins, State Sanatorium, Ark.; Kentucky University Medical Department, Louisville, 1905; veteran of World War I; associated with the Arkansas Tuberculosis Sanatorium; died in Little Rock Dec. 8, aged 76.

Blain, Alexander William ® Detroit; born in Detroit March 4, 1885; Detroit College of Medicine, 1906; formerly on the faculty of his alma mater, now known as the Wayne University College of Medicine; past-president of the Wayne County Medical Society, Detroit Academy of Surgery, and the Alumni Association of Wayne University; member of the board of the Michigan Horticultural Society, serving as president in 1944-1945; a trustee

of the Detroit Zoological Society; fellow of the Royal Society of Arts, New York Academy of Sciences, American College of Surgeons and served as a member of its board of governors, and the American Association for the Advancement of Science; member of the public welfare commission of Detroit from 1926 to 1933 and president 1931-1932; member and past-president of the Superintendents of the Poor of Wayne County; member of the commission of conservation for the state of Michigan from 1939 to 1945; past-president of the Michigan Audubon Society; member of the Nu Sigma Nu, Sigma Xi, and Alpha Omega Alpha; director of the Gorgas Memorial Institute; chief of staff, Blain Clinic; senior surgeon at Alexander Blain Hospital; consulting surgeon at the Wayne County General Hospital, Eloise, Detroit Memorial Hospital, and the Receiving Hospital of the City of Detroit; on the consulting staff of Detroit Tuberculosis Sanatorium; specialist certified by the American Board of Surgery; member of the editorial staff, Washington Institute of Medicine, Washington, D. C., and member of the editorial board, *Revista Argentina-Norteamericana de Ciencias Medicas*; in 1930 was presented with an honorary master of science degree by his alma mater; died in the Alexander Blain Hospital Dec. 14, aged 73.

Blandford, William Clarke ® Atlanta, Ga.; Emory University School of Medicine, Atlanta, 1917; died Dec. 1, aged 71.

Blanton, Howson Wallace ® Richmond, Va.; Columbia University College of Physicians and Surgeons, New York City, 1917; associate professor of clinical medicine at the Medical College of Virginia; veteran of World War I; past-president of the Hampden Sydney Alumni Association; died in St. Luke's Hospital Dec. 12, aged 66.

Brenza, Sylvester A., Deerfield, Ill.; Chicago College of Medicine and Surgery, 1910; associated with Holy Cross, Englewood, and St. Mary's hospitals in Chicago, where he was president of the Metropolitan State Bank; died in Gulfport, Miss., Dec. 5, aged 67.

Brown, Hugh Osborne ® Salt Lake City, Utah; Northwestern University Medical School, Chicago, 1937; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists, Inc., of which he was vice-president in 1943; on the faculty of the University of Utah College of Medicine; served as a fellow in anesthesiology at the Mayo Foundation in Roches-

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ter, Minn.; formerly on the staff of the Cook County Hospital in Chicago; chief of anesthesia at St. Mark's Hospital, where he died Dec. 5, aged 48.

Bryan, Herman Lawrence, Dallas, Texas; University of Texas School of Medicine, Galveston, 1952; on the faculty of the University of Texas Southwestern Medical School; veteran of World War II; interned at the Jackson Memorial Hospital in Miami, Fla.; served as resident at the Charity Hospital of Louisiana in New Orleans and the Parkland Memorial Hospital; died Dec. 2, aged 36.

Bush, Charles R., Macon, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1894; died Dec. 5, aged 86.

Collier, Henry L., Norfolk, Va.; University College of Medicine, Richmond, 1909; for many years a director of the Daily Press, Inc., and vice-president of the Peninsula Newspaper Publishing Corporation; a director of the Hampton Roads Broadcasting Corporation (WGH); served on the staffs of Norfolk General Hospital, De Paul Hospital, and Leigh Memorial Hospital; died Dec. 4, aged 72.

Cook, Benjamin Biscoombe, Fern Glen, Pa.; Medico-Chirurgical College of Philadelphia, 1913; died Dec. 6, aged 69.

Cushing, Russell George ® Detroit; Detroit College of Medicine and Surgery, 1929; member of the American Academy of General Practice; on the staff of the Holy Cross Hospital; died Dec. 1, aged 56.

Davis, Urey Guess, St. Petersburg, Fla.; Louisville (Ky.) Medical College, 1907; veteran of World War I; at one time practiced in Russellville, Ky., where he was health officer of Logan County; for many years associated with various Veterans Administration hospitals; died in the Veterans Administration Hospital in Bay Pines Dec. 9, aged 73.

DeVelling, John Robin ® Jackson, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1912; fellow of the American College of Surgeons; veteran of World War I; served in the regular U. S. Army; at one time practiced in Rosiclare, Ill., and Laurel, Miss.; died in the University Hospital Dec. 2, aged 72.

Dooley, Marion Sylvester ® Syracuse, N. Y.; Syracuse University College of Medicine, 1914; professor emeritus of pharmacology at State University of New York College of Medicine; past-honorary-president of the International Anesthesia Research Society; served as a member of the U. S. Pharmacopoeia Revision Committee many years; editor of "Interns Handbook"; joint author of "Pharmacology and Therapeutics in Nursing"; on the honorary staff of the Hospital of the Good Shepherd, where he died Dec. 13, aged 78.

Dudley, Stowell Barnard ® Caldwell, Idaho; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; veteran of World War I; died in Parma Dec. 2, aged 92.

Edwards, Charles John Jr., Natchez, Miss.; Tulane University School of Medicine, New Orleans, 1940; veteran of World War II; died in New Orleans Dec. 16, aged 46.

Eller, William Douglas ® New York City; born in New York City May 12, 1910; University of Arkansas School of Medicine, Little Rock, 1941; specialist certified by the American Board of Dermatology and Syphilology; fellow of the New York Academy of Medicine; member of the American Academy of Dermatology and Syphilology and the Association of Military Surgeons of United States; a trustee of the Pan-American Medical Association and vice-president of its dermatological section; veteran of World War II; clinical instructor of dermatology and syphilology, New York University College of Medicine; on the staffs of the New York University-Bellevue Medical Center and Metropolitan Hospital; wrote many articles on his specialty, and was co-author of "Tumors of the Skin: Benign and Malignant"; died in the Midtown Hospital Dec. 9, aged 48.

Emrich, William ® Hebron, Md.; University of Maryland School of Medicine, Baltimore, 1902; died in the Peninsula General Hospital in Salisbury Dec. 15, aged 79.

Farmer, David Kyser ® Mansfield, Ill.; University of Louisville (Ky.) School of Medicine, 1935; served overseas during World War II; health officer of Mansfield; on the staff of the Burnham City Hospital in Champaign; died Dec. 15, aged 49.

Foreman, Harry Lee ® Indianapolis; Indiana University School of Medicine, Indianapolis, 1917; past-president of the Indianapolis Medical Society; member of the American Academy of General Practice; served as superintendent of the Indianapolis City Hospital; associated with Methodist and St. Vincent's hospitals; died Dec. 3, aged 75.

Frazer, George Brasfield, Houston, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1902; died Dec. 3, aged 79.

Gettings, Joseph Roland, Buffalo; University of Buffalo School of Medicine, 1925; served on the faculty of his alma mater; associated with the Emergency Hospital and Sisters of Charity Hospital; died Dec. 15, aged 58.

Mayers, Morton Myron ® Los Angeles; University of California School of Medicine, San Francisco, 1930; assistant clinical professor of surgery at the University of California School of Medicine; specialist certified by the American Board of Urology;

member of the American Urological Association; fellow of the International College of Surgeons and the American College of Surgeons; veteran of World War II; associated with the Queen of Angels Hospital, where he died Nov. 20, aged 54.

Mellies, Edward, Owensville, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1893; member of the school board; died in St. Francis Hospital, Washington, Oct. 31, aged 87.

Mitchell, Charles Otis, Fresno, Calif.; University of Colorado School of Medicine, Denver, 1907; an associate member of the American Medical Association; past-president and secretary of the Fresno County Medical Society; served in France during World War I; died Nov. 23, aged 80.

Moore, Cannon Deuger @ Oklahoma City, Okla.; Baylor University College of Medicine, Dallas, Texas, 1922; associated with the Wesley Hospital; died in the Mercy Hospital Nov. 12, aged 61.

Motel, William Goodrich @ Chicago; University of Illinois College of Medicine, Chicago, 1937; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; veteran of World War II; associated with South Shore Hospital, Jackson Park Hospital, and the Michael Reese Hospital, where he died Dec. 9, aged 46.

O'Hara, Thomas Aloysius, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1897; for many years on the staffs of St. Agnes Hospital and the Hospital of the University of Pennsylvania; died Nov. 18, aged 84.

Parker, Paul Martin, Moravia, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York City, 1915; veteran of World War I; formerly county coroner; died in Clifton Springs, Nov. 30, aged 74.

Pollock, Clifford J. @ Holland, Ohio; Toledo Medical College, 1912; died in the Mercy Hospital, Toledo, Nov. 30, aged 74.

Reed, Hugh Stephen @ Guide Rock, Neb.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1906; died in St. Joseph's Hospital, Concordia, Nov. 16, aged 79.

Renfrew, Francis Charles, Portland, Ore.; Miami Medical College, Cincinnati, 1903; at one time practiced in Long Beach, Calif., where he was associated with the Community Hospital, and served as president of the Chamber of Commerce; died Nov. 29, aged 82.

Renken, Paul William @ New Orleans; Tulane University School of Medicine, New Orleans, 1931; on the faculty of his alma mater; specialist certified by the American Board of Ophthalmology; member

of the American Academy of Ophthalmology and Otolaryngology; president of the New Orleans Academy of Ophthalmology; associated with the Charity and Southern Baptist hospitals; veteran of World War II; died Nov. 22, aged 51.

Rhodes, Walter R. @ Toledo, Ill.; Rush Medical College, Chicago, 1902; associated with St. Anthony Memorial Hospital in Effingham and the Memorial Hospital in Mattoon; died Nov. 29, aged 80.

Richards, George Girard, Pinconning, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1904; died Nov. 14, aged 81.

Robinson, Wilton Howarth @ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; died in the Southside Hospital Nov. 20, aged 80.

Runyon, Leon Iral @ Obion, Tenn.; University of Tennessee College of Medicine, Memphis, 1942; veteran of World War II; on the staff of the Obion County General Hospital in Union City; died Nov. 9, aged 49.

Russell, Paul Livingston @ Inglewood, Calif.; University of Minnesota Medical School, Minneapolis, 1944; member of the American Academy of General Practice; veteran of World War II; associated with Hawthorne (Calif.) Community Hospital, Centinela Valley Community Hospital and Daniel Freeman Memorial Hospital; died Nov. 17, aged 42.

Ryan, William John Joseph, San Diego, Calif.; Northwestern University Medical School, Chicago, 1922; veteran of World War II; died Nov. 1, aged 64.

Smith, Prentiss Edward @ Hattiesburg, Miss.; Tulane University School of Medicine, New Orleans, 1926; member of the Southeastern Surgical Congress; fellow of the International College of Surgeons and the American College of Surgeons; associated with the Forrest County General Hospital and the Methodist Hospital, where he died Nov. 30, aged 57.

Steinbach, Henry Barthell @ Detroit; State University of Iowa College of Medicine, Iowa City, 1920; member of the American College of Cardiology and the American College of Gastroenterology; fellow of the American College of Physicians; veteran of World War I; associated with the Grace Hospital, Harper Hospital, and the Woman's Hospital; died in New York City Nov. 21, aged 65.

Strachan, Harry Morris @ Shaker Heights, Ohio; University of Louisville (Ky.) Medical Department, 1911; specialist certified by the American Board of Preventive Medicine; member of the Aero Medical Association; veteran of World War I; served as examiner for the Civil Aeronautics Administration; died Nov. 18, aged 71.

Taliaferro, Robert Milton @ Lynchburg, Va.; Medical College of Virginia, Richmond, 1897; for many years surgeon for the Norfolk and Western Railway and physician for Lynchburg Jail; died in Staunton Nov. 26, aged 84.

Tennant, Charles C., Farmville, Va.; University of Virginia Department of Medicine, Charlottesville, 1904; veteran of World War I; died in Charlottesville Dec. 1, aged 80.

Thompson, Holman Bennett @ Fort Smith, Ark.; University of Arkansas School of Medicine, Little Rock, 1915; died Nov. 24, aged 72.

Trent, Russell John, Lieut. Commander, U. S. Navy, retired, La Jolla, Calif.; University and Bellevue Hospital Medical College, New York City, 1914; veteran of World Wars I and II; retired June 30, 1937; died Nov. 5, aged 66.

Vacin, Milo Edward @ Riverside, Ill.; University of Illinois College of Medicine, Chicago, 1929; veteran of World War II; dean and treasurer of the Worsham College of Mortuary Science; vice-president and past-president of the staff, Bethany Sanitarium and Hospital, Chicago, where he died Nov. 22, aged 57.

Van de Sand, Gerard F. @ Fulton, Ill.; Chicago College of Medicine and Surgery, 1916; served as examining physician for the draft board in World War II; for many years was the city health officer; died Nov. 5, aged 77.

Van Loan, James Casper Plimpton, Keene, N. Y.; College of Physicians and Surgeons, medical department of Columbia College, New York City, 1891; for many years practiced in New York City; died in the Keene Valley (N. Y.) Hospital Nov. 14, aged 90.

Villien, Joseph A., Maurice, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1890; served as mayor, postmaster, and on the Vermilion parish school board; a director of the Abbeville and Trust Company; died in Abbeville Nov. 5, aged 88.

Vitols, Theodore Mikelis @ Minneapolis; Latvijas Universitāte Medicinas Fakultate, Riga, Latvia, 1928; died in Toronto, Ont., Canada, Nov. 3, aged 55.

Vye, Theodore Roland @ Billings, Mont.; College of Medical Evangelists, Loma Linda and Los Angeles, 1928; fellow of the International College of Surgeons and the American College of Surgeons; secretary-treasurer of the Montana Medical Association; president of the Montana Physicians' Service; associated with St. Vincent Hospital and the Billings Deaconess Hospital; died Nov. 30, aged 56.

Wainright, Melvin A. Rice @ Shrewsbury, N. J.; Temple University School of Medicine, Philadelphia, 1938; veteran of World War II; chief of staff and president of the medical board, Riverview Hospital in Red Bank; died in Red Bank Nov. 3, aged 46.

Walker, Howard McKinley @ Dodgeville, Wis.; Rush Medical College, Chicago, 1927; clerk of the school board of Dodgeville; city health officer; died in the Dodgeville General Hospital Nov. 21, aged 57.

Walker, Samuel G., Hot Springs National Park, Ark.; Meharry Medical College, Nashville, Tenn., 1908; died Nov. 3, aged 74.

Wanner, Jay George @ Rock Springs, Wyo.; Chicago Medical School, 1918; veteran of World War II; at one time district surgeon for the Union Pacific Railroad in Green River; served as president of the Sweetwater County Medical Society; associated with Memorial Hospital of Sweetwater County; died Nov. 27, aged 63.

Warfield, William Pollock @ Clarksdale, Miss.; University of Tennessee College of Medicine, Memphis, 1932; member of the American Academy of General Practice; died Nov. 30, aged 52.

Watkins, McLeod McInnis, Cincinnati; Vanderbilt University School of Medicine, Nashville, Tenn., 1958; intern, Cincinnati General Hospital; died Nov. 4, aged 24.

Weiss, Joseph Guy, Pontiac, Mich.; Wayne University College of Medicine, Detroit, 1935; during World War II associated with the U. S. Public Health Service Reserve; member of the American Academy of General Practice; resident in psychiatry at the Pontiac State Hospital; died Nov. 6, aged 51.

Worth, Archibald Carter Jr., Albany, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York City, 1910; member of the Medical Society of the State of New York; died in the Memorial Hospital Nov. 29, aged 73.

Yarbrough, Silas McWilliams @ Gainesville, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1923; veteran of World War I; past-president of the Cooke County Medical Society; past-president of the Gainesville Kiwanis Club; died Nov. 9, aged 59.

Yarling, John E. @ Peru, Ind.; Medical College of Ohio, Cincinnati, 1897; past-president and secretary of the Miami County Medical Society; served as mayor, city health officer, county health officer, and county coroner; at one time member of the city council; president of the First Federal Savings and Loan Association; honorary staff member, Dukes-Miami County Hospital, where he died Nov. 8, aged 89.

FOREIGN LETTERS

BRAZIL

Hypothermia and Circulatory Arrest.—Dr. G. M. Santos and co-workers of the Santa Theresa Hospital, Rio de Janeiro, (*Revista brasil. cir.* 36:279, 1958) anesthetized 25 dogs with pentothal (Thiopenbutal) sodium and curare (Flaxedyl) in varied doses, and subjected them to orotracheal intubation and controlled respiratory ventilation by means of an apparatus with either positive or positive and negative alternating pressures or a respiratory pouch. Hypothermia was produced by immersion in cold water for an average period of 30 minutes, which caused the rectal temperature to drop to 31 C (87.8 F). Each animal was removed from the bath, the thorax was opened, and circulatory arrest induced by ligation of the caval veins for an average period of eight minutes. After this they were sutured and warmed until the rectal temperature reached 36 C (96.8 F).

The authors observed that the decrease of the dog's rectal temperature during the cold bath was regular, and averaged 1 C (1.8 F) for each minute. The greater the body weight of the animal the slower was the fall of its rectal temperature. The velocity of the fall of temperature was increased by administration of curare. The fall of temperature (average 4 C [7.2 F]) persisted after the animals were removed from the bath. The frequency of the heartbeats diminished with the fall of temperature. The heart rate became stable when the minimal rectal temperature was attained (average 27 C [80.6 F]). The blood pressure also decreased, although there was a tendency, while in the cold bath, for it to increase about 10 mm. Hg after an initial fall of about 20 mm. Hg. Ventricular fibrillation was a frequent, serious, and unexpected accident during hypothermia. Doses of pentothal sodium above 15 mg. per kilogram of body weight and body temperatures below 26 C (78.8 F) were responsible for ventricular fibrillation. Coronary perfusion with neostigmin was useful in preventing fibrillation. Electric defibrillation and heart massage, effective in 15 of 16 cases, was the ideal treatment for ventricular fibrillation. The duration of hypothermia was considered important in evaluating the final results and post-operative physiological conditions. The best experimental conditions for a cardiac arrest of eight minutes are a rectal temperature around 26 C (78.8 F) and slight hypnosis induced by 1 mg. of

curare per kilogram of body weight. For complete recovery the whole procedure should not exceed two hours.

Adenocarcinomatous Polyps of the Colon and Rectum.—The importance of the adenomas of the colon and the rectum as precursors of carcinoma has been gaining recognition. Dr. Sylvio Levy of the Hospital dos Servidores, Rio de Janeiro (*Hospital* 54:483, 1958) reported a series of 6,604 successive patients in 102 (1.54%) of whom a diagnosis of polyps was made (98 with polyps of the rectum and 4 with polyps of the sigmoid colon). The ratio of males to females was 2:1. Of the 102 patients histological examinations were made on 67 with the following diagnoses: inflammatory polyps, 4; lobulated adenomas, 45; and carcinomas in adenomas, 18. One curious aspect of this series was the presence of polyps in three cases, all considered malignant, in patients in the first decade of life.

Diabetic Vascular Syndrome.—Dr. P. C. Rebocho and co-workers of the São Paulo State University (*Hospital* 54:677, 1958) studied 50 patients with diabetes (average age 59.3 years). Retinopathy of various degrees was present in 46 and was markedly influenced by the state of control of the diabetes. Intercapillary glomerulosclerosis was present in 18 and 33 had signs of myocardial disease. Arterial hypertension was present in 34 among whom 24 were obese. The blood cholesterol level was determined in 20 and was increased in 13. Peripheral vascular lesions were found in 27. Obesity was present in 15 of these and an increased cholesterol level in 8. Peripheral vascular lesions did not depend on the state of control of the diabetes. Neuropathies were found in 40 but were not correlated with the state of control of the disease. Although the authors could not establish a relationship between the various types of lesion observed, their attention was attracted to the frequency of the simultaneous presence of several lesions. Seven patients showed two types of lesion, 16 had three, 13 had four, and 7 had five. These figures confirm the present theory that the vascular lesions of diabetes are localized manifestations of a generalized disease. Whether the arterial lesions are mere complications of arteriosclerosis or constitute a diabetic angiopathy is not yet known. The authors stress the necessity of looking for vascular lesions in every patient with diabetes.

GERMANY

Isoniazid and Vitamin B₆ Metabolism.—A frequently observed side-effect from isoniazid used in the treatment of tuberculosis is polyneuritis. This is ascribed to the antimetabolic action of the drug on vitamin B₆ metabolism. Niacin metabolism is not disturbed. An antagonism between isoniazid and vitamin B₆ in growing micro-organisms has been reported several times. The derangement of vitamin B₆ functions during isoniazid therapy also affects tryptophan metabolism. Knapp and co-workers (*Klin. Wchnschr.* 36:819, 1958) found that 9 of 17 patients with various forms of skin tuberculosis excreted more than 30 mg. of xanthic acid in the urine after administration of 10 Gm. of dl-tryptophan. In 322 patients with various forms of skin tuberculosis treated with 4 to 7 mg. of isoniazid per kilogram of body weight per day, such side-effects as giddiness, urticaria, gastrointestinal disorders, depression, paresthesias, and neuritides were observed in 123. The vitamin B₆ deficiency was undoubtedly due to the isoniazid. There was, however, evidence that the body could adapt itself to isoniazid. As a result of this adaptation, vitamin B₆ deficiency and also subjective symptoms decreased. The authors argue convincingly for a competitive antivitamin B₆ effect exerted by isoniazid. In tests with healthy subjects the antagonism was shown to exist at least for part of the vitamin B₆ functions. The results do not yet explain the mechanism of this antagonism.

Treatment of Pernicious Anemia.—A series of 39 patients with compensated and 22 with decompensated pernicious anemia was treated exclusively with various combinations of vitamin B₁₂ and intrinsic factor given by mouth. The patients were given, every second day, 5 mcg. of vitamin B₁₂ and the corresponding quantity of an intrinsic factor preparation. Of 17 patients, 11 became decompensated in the course of five years; i. e., their erythrocyte counts declined below 4,000,000 per cubic millimeter and their hemoglobin concentrations below 80%. Their feeling of well-being deteriorated, but there were no neurological complications.

Summarizing the results I. Boll (*Arztl. Wchnschr.* 13:930, 1958) concluded that the favorable effect observed in the first two years of oral treatment was not maintained when the treatment continued for several years. Intramuscular injections of vitamin B₁₂, even in low dosage, proved superior to oral treatment. In 5 patients with decompensated anemia oral treatment failed to achieve compensation at any time, and of 13 patients who became compensated at some time during the initial period of treatment 8 became decompensated again within two years, a total of almost 80% unsatisfactory results. It may be that intrinsic factor from hog stomach is not sufficiently effective for prolonged

treatment or an antibody reaction to the heterologous substrate may develop on continuing administration. In another study it was observed that patients receiving a single intramuscular dose of 1 mg. of vitamin B₁₂ were compensated for longer than a year, notwithstanding reports that after administration of such a large dose more than 50% is excreted in the urine within a few days.

Epidemic of Erythema Infectiosum.—Since the middle of 1958 a violent epidemic of erythema infectiosum has been observed in West Germany. The epidemic occurred first in Schleswig-Holstein and Oldenburg, and then spread southward. A similar but not so violent epidemic was observed in 1866 in Graz and in the winter of 1913-1914 in Breslau. The epidemic was almost certainly caused by a virus. In the virological laboratories of the dermatological clinic of Hamburg University an organism was isolated and neutralized, and complement-fixing antibodies were detected in the patients' serums. Most probably it was a variant of an already known virus. The exanthem (circular, red, and maculopapular) usually started in the face and spread to the extremities and the trunk. Temperatures were seldom higher than 38 C (100.4 F) and, apart from the severe itching, the general health was hardly impaired. The incubation period was 7 to 14 days, and the communicability was small. Because of this and the mild course of the disease isolation was not considered necessary. The treatment was symptomatic: antihistaminics were given to soothe the itching, antipruritic embrocations applied, and vitamin C was given empirically.

Metabolism of Cancer Cells.—At the meeting of the German Association of Scientists and Physicians in Wiesbaden Professor Warburg stated that there is most probably no exception to the rule that normal body cells "breathe" while cancer cells do not breathe but ferment. Fermentation was the energy-supplying reaction of life when the atmosphere did not yet contain oxygen. As fermentation requires, for the production of the same quantity of energy, about 10 times as much substance as breathing, it is a less refined kind of biological energy production. In the course of phylogenesis, fermentation was supplanted by breathing (oxidation) in all the higher forms of life, but all living beings still possess the capacity to ferment if the cells are deprived of oxygen. Breathing is the attribute of normal growth, fermentation the attribute of abnormal growth. In the development of the cancer the following metabolic pattern is observed: at first abnormal growth, disengagement of respiration, and increase of fermentation. This is followed by a decrease of respiration. In the last phase of carcinogenesis the tumor cells develop a resistance to cytolytic agents and can then grow on, infiltrating and metastasizing. In water x-rays in the presence of

oxygen produce hydrogen peroxide. Cancer cells contain less catalase than normal cells and are thus extremely sensitive to hydrogen peroxide. The sensitivity to radiation of cancer cells should therefore increase if during radiation the erythrocytes, which contain an enormous quantity of catalase, could be eliminated. The radiated parts of the body would thus have to contain a liquid which is free from red blood cells but nevertheless contains oxygen.

Cystic Fibrosis.—Cystic fibrosis of the pancreas is characterized by meconium ileus, steatorrhea with absence of growth and weight increase, progressive bronchiectasis, and abnormal electrolyte concentrations in the perspiration. The concentration of sodium and chlorine in the perspiration is five times higher than normal, but there is hardly any change in the potassium concentration. It can always be shown that some blood relatives who show no clinical signs of the disease have the same changes in the perspiration. Klinker and co-workers (*Deutsche medizinische Wochenschrift*, 1958) made investigations that led them to conclude that the general disturbance consists in a change of the cell mechanism (probably of all cells) responsible for homeostasis. A chemical change in the secretion of the mucigenous glands causing increased viscosity of the mucus may also occur. It cannot be said whether this is a direct consequence of the disturbed osmotic cell mechanism or whether it is due to a secondary metabolic abnormality. Judged by clinical experience the latter could arise only on the basis of the general osmotic disorder.

Longevity of Erythrocytes.—If one applies only such methods for determining serum substances with auto-antibody action as the Coombs' test and cold agglutinin determination to detect hemolytically active factors in the serum of leukemic patients, these will only be found in rare cases. As all hemolytic syndromes are associated with a shortening of the life of the erythrocyte, which is proportional to the degree of development of the syndrome, the modern method of labeling the erythrocytes by means of Cr^{51} are, according to Bruschke and Hennemann (*Deutsches Arch. klin. Med.* 205:263-275, 1958), a safe diagnostic measure to determine the hemolytic factor of anemias in leukosis. The use of this method in six patients with myelosis, three with lymphadenosis, and one with paramyeloblastic leukemia showed that in nine of these patients the life of the red blood corpuscles was shortened. One patient with lymphadenosis and the patient with paramyeloblastic leukosis, who showed a hemolytic syndrome due to antibodies with positive results of Coombs' test, did not differ from the other eight patients as regards longevity of the erythrocytes. In these two patients the degree of the anemia did not seem to depend on the antibody findings. No interdepend-

ence between the shortened lifetime of the erythrocytes and the degree of the anemia or the size of the spleen could be found.

INDIA

Meprobamate in Psychiatry.—M. L. Joshi and co-workers (*Journal of the Association of Physicians of India*, vol. 6, Oct. 4, 1958) used meprobamate to treat 29 outpatients with various psychiatric disorders (11 with agitated depression, 7 who had somatic manifestations of anxiety, 5 who had excessive, organically based psychomotor activity, 4 with schizophrenia, one with a compulsive obsessive neurosis, and one with hypochondriasis). The period of study lasted three or four weeks so that there was little chance to establish rapport or to change environmental factors; 23 received meprobamate tablets alone and 6 were given meprobamate as well as placebo tablets containing 3 mg. of quinine each in order to imitate the bitter taste of meprobamate. The meprobamate was given in three equal doses of 1.2 to 1.4 Gm. a day. Complete relief was obtained in 6 patients, marked improvement in 3, moderate improvement in one, slight improvement in 9, and no improvement in 10. Of the 11 patients with agitated depression 4 obtained complete relief, 1 was moderately improved, 2 showed slight improvement, and 4 did not respond. Of the six who had anxiety with somatization one showed marked improvement, one moderate improvement, three slight improvement, and one was not benefited.

Of the two patients with excessive, organically based psychomotor activity, one improved markedly while the other showed no improvement. The response in the rest of the patients in the series was negligible. Of the six who received meprobamate and a placebo in alternate weeks, one showed marked improvement on meprobamate alone, but returned to the original state when the meprobamate was stopped and the placebo started. The favorable response returned when meprobamate therapy was resumed. In the other five the results were not so clear cut. Improvement occurred whenever either of the tablets was used but stopped as soon as the tablets were withdrawn. In patients with agitated depression, the improvement was characterized by lessened irritability, a general sense of well-being, and a decrease in morbid preoccupation with symptoms; there was a sense of relaxation with greater ability to concentrate and a return to more active social life. These changes were noticed within a few days of starting treatment. On the whole, patients with excessive psychomotor activity showed the greatest unfavorable response; eight, receiving 800 mg. of meprobamate three times a day, suffered from drowsiness, giddiness, weakness, and ataxia, but these symptoms

disappeared when the dosage was reduced. The results did not improve significantly when dosage was increased from 3 to 6 tablets a day.

Serum Electrolytes at Different Blood Pressure Levels.—Mathur and Wadhawan (*Journal of the Association of Physicians of India*, vol. 6, October, 1958) reported that although there is sufficient experimental evidence to indicate that the sodium chloride content of the intracellular tissue of hypertensive experimental animals is increased, and hypertension is thus generally believed to be associated with alteration of intracellular electrolytes, it is not known definitely whether these changes are associated with similar changes in extracellular fluids and plasma. The authors studied 50 normal subjects and 30 hypertensive patients with similar dietary habits belonging to the same socioeconomic group. Patients showing evidence of cardiac decompensation or any other disease were excluded from the study. The serum sodium level was found to be higher in patients with hypertension than in normal subjects, and showed a tendency, neither constant nor significant, to rise with increase in the systolic blood pressure. A more definite increase in the serum sodium level was seen with a rise in the diastolic blood pressure, the former varying directly with the latter. The serum potassium levels were slightly lower in the hypertensive patients as compared to the controls, but there was no definite relationship between systolic and diastolic readings and the level of serum potassium.

Intrapleural Pressure in Ascites.—P. N. Laha (*Journal of the Indian Medical Association* vol. 31, Nov. 1, 1958) studied the changes in intrapleural pressure in 20 patients with ascites caused by portal cirrhosis. The modified Lillington and Pearson pneumothorax apparatus was used to measure the intrapleural pressure, and the site of the readings varied from the second to the fifth right intercostal space depending on the level of the diaphragm. In the first 10 patients the intrapleural pressure was measured before and soon after paracentesis abdominis and in the other 10 before and 24 hours after drainage of the ascitic fluid. The intrapleural pressure was found to be within normal range during both inspiration and expiration in 10 patients. In 16, including the first 10, it was normal during inspiration; and in 11, also including the first 10, it was normal during expiration. In six the intrapleural pressure was normal during inspiration but positive during expiration; less than normal during inspiration with normal pressure during expiration in one, and less than normal during inspiration and positive during expiration in three. This modification in one phase of respiration was due to a compensatory emphysema in those patients in whom ascites produced mechanical obstruction to respiration.

The degree of modification in the intrapleural pressure varied with the degree of emphysema, the modification being slight and only on expiration when the emphysematous changes were slight, except in one patient in whom the only modification was a diminution in intrapleural pressure below the normal minimum on inspiration with normal pressure on expiration. The changes in intrapleural pressure in emphysema were due to alteration in lung elasticity produced by this condition. The readings taken soon after draining of the ascitic fluid did not show any significant alteration in the intrapleural pressure from the paracentesis level. The changes in intrapleural pressure in five patients due to compensatory emphysema also remained about the same after drainage of the ascitic fluid. Thus the compensatory emphysema with its resultant alteration in pulmonary function, reflected in the intrapleural pressure, did not revert back to normal soon after relieving the mechanical obstruction to respiration caused by the ascitic fluid. The readings for intrapleural pressure taken 24 hours after paracentesis showed that there was no significant change, while the modification of intrapleural pressure in one or both phases of respiration, due to compensatory emphysema of the lungs, remained practically unchanged in three patients but showed significant variation in two from the positive pressure during expiration to normal figures after draining of the fluid. Thus the compensatory emphysema reverted back to normal in two patients 24 hours after relief of ascites, although clinical signs of emphysema persisted. The duration or amount of ascites had no significant correlation with the modifications of intrapleural pressure.

Nicotinic Acid in Optic Atrophy.—Mathur and Gupta (*Journal of the Indian Medical Association*, vol. 31, Nov. 1, 1958) used nicotinic acid to treat four patients with optic atrophy resulting from tuberculous meningitis. Three were under 5 and one was 24 years of age. The children were given nicotinic acid orally in daily doses of 100 mg. and the adult was given 300 mg. daily. The treatment was continued for six months in one and four months in the other three. Two of the patients showed definite improvement during the course of treatment. They were followed up for three months and were declared cured. The other two did not improve during the course of treatment; probably irreversible changes consequent on the longer duration of the optic atrophy before treatment was started or some other unknown factor was responsible for the failure of their treatment. K. J. Vyas gave eight patients, all children between 2 and 8 years of age whose blindness was due to tuberculous meningitis, nicotinic acid by mouth. They were given an initial dose of 100 to 150 mg. daily followed by 50 mg. daily. Five had normal vision at the

end of treatment. In one case the drug was given for only 12 days and the absence of response was due to the short duration of therapy. In another case the failure may have been due to irreversible damage to the optic nerve or the occipital lobe, as the child was unconscious for three months and had severe neurological damage at the time of admission. In the third case failure of response may also have been due to severe neurological damage. Improvement in those who recovered their vision started within 17 days of treatment except in one patient who could see close objects only after 47 days of treatment. Temporary side-effects were seen in only one patient, a child who developed a flush all over the body lasting for over an hour after the administration of nicotinic acid.

Tuberculosis in Contacts.—Warawdekar and Shah (*Indian Journal of Medical Sciences*, vol. 12, October, 1958) made a mass miniature roentgenographic study to determine the incidence and morbidity of pulmonary tuberculosis in home contacts of patients suffering from active pulmonary tuberculosis; 1,605 unselected patients suffering from active pulmonary tuberculosis were included in the study. All the members in the families of these patients (7,305) were investigated with mass miniature roentgenograph. The positive findings were grouped into the following categories: primary complex; progressive primary complex; pleural effusion; active pulmonary lesions such as bronchopneumonic, pneumonic, cavitating, and fibrotic; quiescent pulmonary lesions; endobronchial tuberculous lesions; calcified lesions; and enlarged tuberculous lymph nodes. Of the 7,305 contacts 514 (7%) were found to be positive for tuberculosis; 44% of these were men, 28% were women, and 28% were children. Of the positive contacts 409 had active pulmonary tuberculosis and in 105 the disease was either healed or arrested. A high incidence of progression of the primary lesion was seen in the age groups under 4 and between 5 and 7 years of age. Active pneumonic and cavitating lesions were most common in adults but most had mild lesions. The study revealed a high incidence of tuberculosis requiring active treatment among contacts.

Antihypertensive Therapy.—H. N. Singh (*The Indian Practitioner* vol. 11, October, 1958) treated 50 patients who had hypertension with tablets containing 0.1 mg. of reserpine and 10 mg. of dihydrazinophthalazine. Patients with a systolic pressure above 150 mm. Hg and diastolic pressure above 100 mm. Hg were selected for trial. Blood pressure readings were repeated on the seventh day of treatment, in the third week, and at the end of treatment. The dose given to most patients was one tablet three times a day but larger doses were given

when the initial pressure was high or the patient did not respond to this dose. The minimum number of tablets used daily was 3 and the maximum 12. The minimum period of treatment was 4 and the maximum 97 days. The series included 10 patients with no cardiac enlargement, 4 with an enlarged heart, 14 with congestive cardiac failure, 3 with renal failure, 11 with cerebral thrombosis, and 8 with other concomitant diseases.

The results on the whole were satisfactory; 56% showed good results with a fall of 20 mm. Hg (systolic or diastolic), 16% gave a fair response, and 28% had a poor result. A gradual fall in systolic and diastolic levels was noticed in the course of treatment. The average time taken to reduce the diastolic pressure by 20 mm. Hg was six days and the average number of tablets required to bring this about was 30.4. The side-effects of reserpine were minimal even with large doses and consisted of mild drowsiness and occasional nasal congestion. Only a few patients complained of infrequent headaches due to the dihydrazinophthalazine. Subjective and objective symptomatic improvement was noticed in all those showing appreciable reduction in their blood pressure.

Tropical Eosinophilia.—M. Viswanathan (*Journal of the Association of Physicians of India* vol. 6, October, 1958) treated 20 patients who had tropical eosinophilia with 750 mg. of diethyl carbamazepine in a single intramuscular injection. The youngest patient was 18 and the oldest 45 years of age. All had pulmonary signs and an absolute eosinophil count of over 2,000 per cubic millimeter. The duration of symptoms varied from 4 to 26 weeks. In 16 patients the presenting symptom was cough and the other 4 complained of wheezing and breathlessness resembling bronchial asthma. Hemoptysis was noted in two, a sense of constriction in the chest in eight, and a low-grade fever in two. Scattered crepitations and occasional rhonchi were the commonest findings. The liver was enlarged and tender in one. The leukocyte count ranged between 10,000 and 52,000 per cubic millimeter. Eosinophils formed 25 to 91% of the total leukocyte count and the maximum absolute eosinophil count was 47,000 per cubic millimeter. All patients showed increased lung markings on radiologic examination and the typical mottling was seen in seven. There was no correlation between the eosinophil count and the roentgenologic findings. The total and differential white blood cell counts were repeated on alternate days after the single injection till normal values were obtained. The cough and wheezing showed signs of abatement within 48 to 96 hours of injection. Four had an aggravation of symptoms in the first 24 hours but definite signs of improvement appeared within 72 hours. Symptomatic relief was complete within a week in all but one.

A rapid fall in the total leukocyte count corresponding to the fall in eosinophil concentration was noticed within 4 to 6 days in 18 patients, and all of these had normal blood cell counts at the end of 10 to 12 days. In one the blood cell count took three weeks to return to normal although symptomatic relief was evident within one week. The patient with an absolute eosinophil count of 47,000 per cubic millimeter had 18,000 eosinophils at the end of 10 days and was given a second injection of 500 mg. His eosinophil count returned to normal in two more weeks. No toxic symptoms were noted in any of the patients.

Clinical Trial with Acetazolamide.—Bhattacharya and Bhuyan (*Journal of the Association of Physicians of India* vol. 6, October, 1958) treated a series of 15 patients (6 with cirrhosis of liver, 6 with nutritional edema, and 3 with hypertensive disease and congestive cardiac failure) with acetazolamide. Their ages ranged from 15 to 70 years. The patients were given a salt-free diet but fluid was not restricted. Those with nutritional edema were given an extra egg and a pint of milk. The protein intake of cirrhotic patients was restricted while the drug was being given and they were encouraged to drink glucose water. No digitalis was given to cardiac patients, and mercurial diuretics were not used during the period of trial. This regimen was observed for three days and the fluid intake and urinary output measured on the third day and taken as a base. Acetazolamide was then started in a dosage of 250 mg. daily by mouth or intravenously in a 25% glucose solution in the morning for three consecutive days. If additional treatment was required, due to the edema, the drug was given for another three days after an interval of three days. The fluid intake and urinary output were measured during the treatment and on the day immediately after its completion.

The average daily diuretic response showed an increase of 52.6, 49.0, and 50.7% over the base output on the three consecutive days of the trial. The net water loss due to acetazolamide averaged 62.9, 65.4, and 58.3% of the fluid intake on each day of the trial. Thus a good diuretic response was obtained with this drug. The effectiveness of a single daily dose was about the same for the three days, but the individual responses showed some variation; 10 patients had more than a 25% increase in output; 2 had the same; and 3 a decreased output. The final result, taking into consideration the response on the fourth day, was excellent in six, good in two, fair in three, and poor in four. The only side-effects noticed were a burning sensation in the abdomen and abdominal pain in the patients with nutritional edema, and these were mild and transitory. None of the patients with cirrhosis or nutritional edema showed signs

of impending hepatic coma, although one cirrhotic patient was given two courses of treatment. Some of those with cirrhosis complained of nausea, anorexia, and abdominal pain. No harmful effects were seen in the peripheral blood. The blood urea level did not rise after completion of treatment, urinalysis showed no changes, and no skin reaction occurred. The diuresis persisted on the fourth day even when no drug was given.

Entamide for Amebiasis.—Sanjivi and Thiruvengadam (*Journal of the Association of Physicians of India* vol. 6, October, 1958) gave Entamide (dichloracet-4 hydroxy N methyl anilide) by mouth for 10 days to 30 patients who were passing cysts of *Entamoeba histolytica* in their stools. Three dosage schedules were used; 15 mg. per kilogram of body weight was given to 13 patients (group 1); 25 mg. per kilogram to 6 (group 2); and 40 mg. per kilogram (group 3). In two the finding of amebic cysts in the stools was accidental, one being treated for bronchiectasis and the other for vitiligo. Associated ankylostomiasis was present in one and ascariasis in another. The drug was given in three equal doses. Disappearance of cysts from stools occurred by the fifth day of treatment in all patients. The period required for eradication of cysts from stools averaged four days in group 3, four and six-tenths days in group 1, and six and eight-tenths days in group 2. The abdominal pain present in 24 was relieved in all but 5 and 6 of the 8 who had loose stools were relieved of this symptom. The amebic hepatitis present in two was unaffected by this drug, although the cysts disappeared from stools as in all other patients.

One of the patients in group 1 had a recurrence of abdominal pain and reappearance of cysts in his stools six months after the first course. He was then given the 40 mg. per kilogram dosage schedule, which gave complete relief, and nine months later there had been no recurrence. One of the patients in group 2 had a recurrence one month after the first course. He did not respond to another course with the larger dosage and was later given a different amebicide. He had developed hepatitis between the two courses of Entamide. All the rest of the patients in the series have been free of symptoms. The relapse rate for the series was 11.3%.

Another series of 26 patients suffering from acute amebic dysentery and passing vegetative forms of *E. histolytica* in their stools was also given the drug to compare its effect on the two phases of the parasitic infestation. Of these 12 had a previous history of amebic dysentery. The duration of the dysentery varied from two days to 18 months. Nine had concomitant amebic hepatitis, three also had ascariasis, one had strongyloidiasis and filariasis with chyluria, and another had chronic malaria. Sixteen patients (group 4) were

given 15 mg. of the drug per kilogram of body weight. The dose was later raised to 25 mg. per kilogram in 7 of these; 10 (group 5) were given 40 mg. per kilogram in three divided doses. The usual period of therapy was 10 days but the drug was discontinued earlier if the dysentery increased in severity or the general condition became worse.

In 12 patients in group 4 blood and mucus disappeared from stools in four days and in 10 the stools became formed on the seventh day. The disappearance of the trophozoites from the stools occurred, on an average, on the third day in 12 patients. In four the drug had to be discontinued and emetine given because of the severity of the dysentery. In two of the patients in group 5 the drug was discontinued after a week and emetine started; in the other 5 the trophozoites disappeared on about the third day and the blood and mucus on the fifth day. In 3 patients in group 5 emetine had to be substituted for the Entamide and in the rest trophozoites disappeared from stools on the fourth day and blood and mucus on the fifth day. The amebic hepatitis and other incidental infections were not affected. The rate of relapse was 48.5%. No side-effects attributable to the drug were noted.

Effects of Sodium on Normotensive and Hypertensive Subjects.—Mathur and Wadhwan (*Journal of the Association of Physicians of India* vol. 6, October, 1958) observed the levels of serum sodium and potassium and the renal excretion of sodium on sodium restriction and sodium load in the diet of 10 hypertensive and 10 normotensive subjects. The hypertensive subjects suffered from essential hypertension, benign or malignant, patients with hypertension associated with kidney disease or cardiac decompensation being excluded from the study. All were given throughout the period of investigation a constant diet consisting of 7 oz. of rice and 4 oz. of curd morning and evening. The low sodium content of rice was an advantage, while the diet was simple and easily available and yielded 30 Gm. of protein, 312.2 Gm. of carbohydrate, 7.2 Gm. of fat, 130 mg. of sodium, and 1,498 calories.

While making observations after loading with sodium, the diet was supplemented with 5 Gm. of sodium chloride given in capsules. Twenty-four-hour urine samples were collected on the first day to determine the sodium content. The rice and curd diet was then started and given for three days during which the urine was collected daily for sodium estimation. The diet was then loaded with sodium chloride by giving the capsules with the basic diet for three days during which the urine was again collected daily for sodium estimation. Samples of blood were also taken initially and on sodium withdrawal and loading to determine the serum sodium and potassium levels. The

mean urinary excretion of sodium prior to salt restriction was comparable in the two groups, although marked individual variations were seen. After withdrawal of sodium the amount of sodium excreted in the urine showed a rapid fall in both groups and there was no appreciable difference between them. On loading with sodium, however, the hypertensive patients showed a tendency to reject more sodium and water than did the normotensive subjects. The levels of electrolytes in the serum showed no appreciable change on withdrawal or loading.

SWEDEN

Knee-Joint Disarticulation.—On the basis of the results in 14 patients on whom disarticulation of the knee was performed, the following conclusions were drawn by Lars Unander-Scharin in *Nordisk medicin* (60:41, 1958). A large, horizontal weight-bearing surface for the prosthesis was obtained. The skin, soft tissues, and bone at the end of the stump adapted to weight-bearing earlier. The muscular control of the stump was better, since the attachments of the muscles remained intact. The leverage on the prosthesis was more effective, because the stump was longer and its end firm and unyielding. The prosthesis was attached to the club-shaped end of the stump by means of a lacer. Shoulder straps or belts were not needed. These devices were also unnecessary for limbs attached by means of suction sockets. Adequate circulation in the stump could be maintained, provided the popliteal artery was ligated below the branching off of the superior genicular arteries. In children growth of the lower part of the femur occurred in 70%, which meant that the length of the stump would remain unchanged in relation to the femur of the sound leg, and thus the problems connected with changes in the shape of the stump would not arise. The making of the prosthesis did not involve any great difficulty. In most cases the patient soon became accustomed to wearing an artificial leg and found it easy to resume his old activities.

Cow's Milk Formula for Infants.—Lars Söderhjelm in *Nordisk medicin* (60:42, 1958) proposed a formula for infants of which 50 to 67% was skimmed milk, about 4% was cane sugar, about 1% was oat or wheat flour, and 2 or 3% was a fat mixture with linoleic acid, which contained additional iron, and vitamins E, C, and B. If desired the mixture can be acidified with citric acid. This formula contains about 600 calories per liter. It is not "humanized" to any great degree and does not contain any bifid factors. The content of lactose is low and that of calcium high in comparison with breast milk, but experience at the pediatrics section of the Skellefteå hospital indicated that similar mixtures were well tolerated and, moreover, they are relatively cheap.

Sedimentation Rate During Pregnancy and Puerperium.—The sedimentation rate (Westergren) was measured in 1,082 healthy pregnant women and in 532 pregnant women with various disorders due to disease, and reported by Clarence Malmnas in *Opuscula medica* (3:9, 1958). The rate rose from a mean of 11 mm. in the 2nd month of pregnancy to 48 mm. in the 10th month. The mean sedimentation rate was highest in the first week of the puerperium (54 mm.) and then rapidly fell in the following weeks, but six weeks after normal parturition it was still somewhat higher than in nonpregnant controls (11 and 8 mm. respectively). The mean sedimentation rate in toxemia of pregnancy was significantly higher than in normal pregnancy and the higher rates in the toxemic group appeared before such other signs of toxemia as proteinuria, edema, and hypertension. In pregnant women with backache of obscure cause, in anemia of pregnancy, abortion, premature birth, and multiple pregnancy the mean sedimentation rate was significantly higher than in normal pregnancy at the same month.

Action of Nicotinic Acid.—The simultaneous equimolar increase in the serum iron and so-called indirect bilirubin after intravenous injection of nicotinic acid can be explained by indirect hemoglobin breakdown. The increase in serum iron and in serum bilirubin after the intravenous injection of 50 mg. of nicotinic acid was studied in 10 normal subjects, 23 patients with hypochromic anemia, 19 with anemia of hyperthyroidism, 23 with polycythemia, and 2 with acholuric jaundice by Karl Gydell (*Acta med. scandinav.* 162:9, 1958). The increase in the two serum components within one hour of the injection was found to be abnormally small in the two groups with anemia and abnormally large in the patients with polycythemia. The increase in the serum bilirubin and serum iron in relation to the hemoglobin level was by far the greatest in the two patients with congenital hemolytic anemia. Exogenic iron and bilirubin loading (after intravenous injections) was compared with endogenic (nicotinic acid induced) loading. As calculated from the relative increases in serum bilirubin and serum iron during the first hour after the injection and by the size of the plasma volume, the amount of hemoglobin broken down was about 0.5 Gm. in normal subjects. In one patient with congenital hemolytic anemia the amount was as much as 3.8 Gm.

Nonuniformity of Pulmonary Ventilation.—Six patients with chronic obstructive pulmonary emphysema, uncomplicated by airway infections, bronchospasm, or right heart failure, were studied by Arend Bouhuys and co-workers (*Acta med. scandinav.* 162:29, 1958) with an open-circuit nitrogen washout method to determine the extent of nonuniform ventilation and the general washout efficiency. The fall of the end-tidal nitrogen concentration and the

amount of nitrogen washed out per breath were measured simultaneously. No consistent differences between the volume and percentage graphs were demonstrated, and for clinical purposes it seems to be sufficient to study only the fall of the end-tidal nitrogen concentration. Four of these six patients showed clearly pathological degrees of unequal ventilation and decreased washout efficiency. The other two had only slightly decreased general efficiency and borderline normal degrees of nonuniformity in spite of spirographic signs of emphysema. One older subject showed completely uniform ventilation in spite of some evidence of diminished ventilatory reserves. One patient had a normal degree of nonuniformity and normal washout efficiency after pneumonectomy.

TURKEY

Viral Exudative Pleuritis.—Dr. Sevki Sonsuz of Izmir (*Forum Medicum*, vol. 2, p. 303) in the internal medicine department of the Canakkale Military hospital within a period of about eight months treated 562 patients with viral exudative pleuritis. The disease began with prostration, chilly sensation, rhinitis, and bronchitis as in influenza. Occasionally high fevers (39 to 40 C [102 to 104 F]) were recorded but frequently moderate fevers were observed. The temperatures of some of these patients were normal. Most of them complained of pain in the side. Dulness to percussion over the lower parts of the lung was found in most of the patients. Pleural puncture revealed serofibrous fluid. All of the exudate withdrawn from these patients gave a positive Rivalta's reaction. At first tuberculosis was considered but since this disease does not occur in such epidemic proportions, another cause had to be sought. Furthermore, results of guinea pig inoculation tests were negative for tuberculosis.

In many of the patients roentgenograms showed no abnormal findings even though after x-ray examination 70 cc. or more of exudate could be removed from the pleural space. Probably in exudative viral pleurisy the reason for the transparency to the x-rays was the inadequacy of colloidal substances in the fluid to produce opacity. A pleurisy transparent to x-ray is not necessarily of viral origin. Sometimes it is impossible to identify a tuberculous pleurisy by roentgenography but in such patients the Rivalta's reaction is negative. When this reaction becomes positive the exudate is opaque. Fresh transudates are also not opaque to the x-ray. Viral exudative pleurisy may be either endemic or epidemic. It occurs especially during autumn and winter when viral infections are prevalent, and its course is usually benign. Explorative pleural punctures are more valuable than x-ray examinations in the diagnosis.

UNITED KINGDOM

Death Certification of Children.—A survey of the accuracy of causes of death given to the registrar at a children's hospital showed that almost half the certifications were not correct as judged by the final diagnosis. Emery and Irvine carried out 150 consecutive postmortem examinations on the bodies of children dying in a Sheffield teaching hospital (*Brit. M. J.* 2:1510, 1958). The physician in charge had previously recorded his opinion of the cause of death based on the clinical findings. The ages of the children varied from a few hours to 12½ years of age. In 55% of cases the clinical findings agreed with those found at autopsy, or differed in only minor respects. In 40% the pathological examination necessitated a complete revision of the stated cause of death. In 5% the cause of death given by the physician was not substantiated at autopsy, nor was any adequate cause of death found on grounds of pathological study. As the deaths occurred in a teaching hospital, it was considered that certification was as accurate as it could be on the basis of purely clinical data.

Clinical Trials on Children.—A question about clinical trials on children was raised in the House of Commons recently. Mr. Swingler, a Labor member, asked the Minister of Health if he had considered the report of a clinical trial in which mentally defective children were used as controls. Had the consent of the parents been obtained, he asked, and what assurance was there that no harm would result to the children? The Minister replied that parental consent had not been obtained, although it should have been, but that the drug used in the trial had no harmful effects. Mr. Swingler said he raised the same question 15 years ago, when children were used in trials with penicillin without the consent of their parents. He considered that this was wrong and that the hospital authorities should be advised on the matter. The Minister replied that a memorandum on the subject had been sent to the Medical Research Council and that investigations of this kind involve medical and ethical problems not susceptible to control and regulations. Another member pointed out that a number of promising research projects involve free access to patients. The Minister concluded by saying that there should be the greatest possible freedom from detailed supervision in clinical research in hospitals.

Physical Activity and Coronary Disease.—In Britain, coronary thrombosis, angina, and arteriosclerotic myocardial degeneration are responsible for about 25% of all deaths in men over 40. Investigations into the causes of coronary heart disease have been directed mainly to an assessment of the significance of intravascular thrombosis, defects in blood coagulation, hormonal factors, and physical

activity. On the basis of observations on deaths from ischemic heart disease in men in various occupations, Morris and co-workers advanced the view that those engaged in physically active work have a lower incidence of ischemic heart disease than those in sedentary occupations. With the cooperation of several pathologists Morris and Crawford have obtained further data in support of this view (*Brit. M. J.* 2:1485, 1958). All departments of pathology in the hospitals of the National Health Service were invited to contribute data on the condition of the coronary arteries and myocardium in 5,000 men aged 45 to 70 coming to autopsy. There were 1,200 deaths from coronary heart disease, 1,000 from conditions with a high prevalence of coronary artery disease, and 2,800 from miscellaneous conditions having no particular association with coronary artery disease. In the 3,800 autopsies performed on men dying from some cause other than coronary disease twice as much ischemic myocardial fibrosis was found in men engaged in light work as in those doing heavy work. Large healed infarcts were three times commoner in light workers than in heavy workers, and four to five times commoner in men between the ages of 45 to 60 years, but only two to three times commoner between the ages of 60 and 70 years. Thus ischemic myocardial fibrosis was commoner in men in light occupations and appeared in them at an earlier age.

The prevalence of coronary atheroma in both groups was high, although not related to physical activity or occupation. Coronary narrowing was also common, irrespective of occupation, but occlusion of a main coronary artery, complete or nearly complete, was commoner in sedentary and light workers than in those engaged in active and heavy work. In the presence of coronary narrowing and occlusion those in light occupations showed more ischemic lesions of the myocardium than did active and heavy workers. The expected relation of ischemic myocardial fibrosis to social class was confirmed, the rate falling 13.3% in class 1 (professional and managerial workers) through 10.5% in class 3 to 7.8% in class 5 (unskilled workers). This trend disappeared, however, when the social classes were broken down into categories of physical activity. Morris and Crawford put forward the hypothesis that physical activity is a protection against coronary heart disease. Men in physically active occupations suffer from it less during middle age; when it does occur it is less severe; and they develop it later in life than men engaged in sedentary occupations. Habitual physical activity was a general factor of cardiovascular health in middle age, and coronary heart disease was in some respects a deprivation syndrome or deficiency disease. In the investigation, the hearts of sedentary and light workers showed lesions comparable to those in the hearts of heavy workers 10 to 15 years older.

Hula-Hoop Syndrome.—The widespread pastime of wriggling hula-hoops around the waist has given rise to what has been called the hula-hoop syndrome. A number of children and young adults have complained of pain at the side of the neck associated with a pain in the upper abdomen. Both are aggravated by movement and in a few the pain is sufficient to produce torticollis. There is a varying degree of reduced movement of the cervical spine, especially rotation, which is limited by pain, and there is spasm and tenderness in one or both of the sternocleidomastoid muscles, the cervical portion of the trapezius muscle, and the paravertebral muscles in the cervical region. There is also tenderness, on palpation of the epigastrium and below the costal margin, which is aggravated by leg raising. The syndrome has been confused with poliomyelitis and meningitis. An active child complained of pains all over and inability to walk. She had moderate neck rigidity, was unable to sit up unsupported, and her lower leg movements were slow and painful. The lower limb tendon reflexes were diminished and the back muscles were tender, especially in the midthoracic region. A provisional diagnosis of poliomyelitis was made, but changed to benign lymphocytic meningitis when the child was hospitalized. These diagnoses were proved incorrect by a normal spinal fluid and rapid recovery of the patient with rest. The symptoms were due to using a hula-hoop at waist and neck level.

Noise in Hospitals.—An inquiry was made into unnecessary noise in hospitals by the King Edward's Hospital Fund for London. A questionnaire was sent to more than 2,000 patients in 15 hospitals for their comments. Many hospitals in large cities are located in areas where the roar of traffic is continuous, but this does not seem to worry most patients, at any rate by day, although at night and in the early morning it may be disturbing. Most of the irritating noise occurs in or just outside the hospital ward and is due to noisy equipment or thoughtless staff. Occasionally patients stated that noisy milk crates and refuse collectors were disturbing, or that they could not sleep because of noisy passersby at night or because of a neighboring dance hall or club. On the other hand nearly half the patients questioned stated that they were not bothered by noise. This is surprising, as the sick and unoccupied patient would be expected to be more sensitive to external stimuli than the normal person, but some of the patients may have been unable to express their views. Telephones, elevators, and carts are a frequent source of noise in hospitals. Adjustments can be made to elevators and carts, but the only solution to the telephone nuisance is to change the call system. Clanging metal bowls can be replaced by plastic ones. Rubber-soled shoes can prevent the clatter of nurses' feet, particularly at night, and noisy manic patients

can be moved to side wards, soundproofed if necessary. These are some of the methods suggested for reducing hospital noises.

Prednisolone for Asthma.—The results of a clinical trial with prednisolone in the treatment of a selected group of 90 chronic asthmatics were described by Brown (*Lancet* 2:1245, 1958). Only asthmatics who had had chronic bronchospasm for at least a year and who had proved refractory to all other treatment for at least a month were included in the trial. Cases of severe bronchial infection and bronchospasm of cardiac origin were excluded. The dose given was 5 mg. three times a day for a week, followed by reassessment and adjustment of the dose, which was reduced to a level sufficient to keep the patient free from wheezing. Any acute spasm was treated by increasing the dose rapidly until it was controlled. It was not thought safe to introduce placebo tablets into the trial because of the well-known dangers of suddenly withdrawing steroids. There was a striking improvement in those patients with eosinophils in the sputum. In general, the greater the number of eosinophils, the more certain was the result; 63% of the patients with eosinophilic sputum showed complete remission under treatment with prednisolone and nearly 8% showed partial relief. Of those with few or no eosinophils 5% showed partial or complete relief. The results thus indicated that in the absence of an eosinophilic sputum a satisfactory response with prednisolone is unlikely. Although the steroid is effective in suitable cases, it never does more than suppress the asthmatic state. This therapy does not cause the disappearance of eosinophils from the sputum, but greatly reduces their concentration.

Unnecessary Use of Penicillin.—Anderson showed that the common practice of using penicillin after operations for septic lesions of the hand is unnecessary in most cases (*Brit. M. J.* 2:1569, 1958). A series of 357 patients with septic hand lesions were given without bias one of three treatments: surgery alone, surgery combined with penicillin by mouth, and surgery with depot penicillin. The conditions dealt with were paronychia, onychia, pulp and other abscesses, septic blisters, and chronic infections that had lasted a month or more before coming under treatment. Attention was focused principally on the rate of healing after the evacuation of pent-up pus. The criteria accepted for healing were a completely dry epithelized wound, full function of the affected part, and no need for further dressings or treatment. The oral dose of penicillin was 1,200,000 units daily in divided doses. Depot penicillin was given intramuscularly morning and evening until the wound had almost healed as a preparation containing 300,000 units of procaine benzylpenicillin and 100,000 units of sodium benzylpenicillin. The average healing times in the three groups were 9.4, 9.5, and

9.2 days respectively. Anderson concluded that careful clinical examination, accurate diagnosis, and careful repair are of greater importance than routine preoperative chemotherapy. Antibiotics do not hasten healing in septic lesions of the hand which require surgical treatment, provided that a careful surgical technique is based on an anatomically accurate diagnosis. Penicillin may be useful in selected cases, however, particularly in web abscesses. The judicious use of penicillin is a more effective counter to the emergence of resistant organisms than is recourse to other antibiotics.

New Anthelmintic.—Goodwin and co-workers (*Brit. M. J.* 2:1572, 1958) compared a new anthelmintic, bephenium hydroxynaphthoate, with tetrachloroethylene in the treatment of 284 patients with hookworm infection in Ceylon. The effectiveness of treatment was judged from the number of hookworm eggs present in 1 ml. of feces before and four days after treatment. The drug was given early in the morning and no food was allowed before or until at least two hours after administration. No purge was given. A single dose of 2 or 3 Gm., or multiple doses given on successive days or three times on the same day, cleared the hookworms and ova as effectively as tetrachloroethylene without producing the toxic side-effects of the latter. Bephenium hydroxynaphthoate was particularly suitable for the treatment of patients with advanced anemia, diarrhea, and heavy helminthic infection because of its low toxicity and because no purge was necessary. It could be given to patients in poor physical condition whereas tetrachloroethylene could not because the latter is unpleasant to take and produces dizziness and nausea. Bephenium hydroxynaphthoate was also found to be effective against roundworm infection, which was present concurrently in many of the patients. Roundworms are resistant to tetrachloroethylene.

Legal Actions in the Health Service.—In reply to a question in Parliament on the cost of legal actions taken by patients against physicians and nurses in the National Health Service, the Minister of Health said that since 1948, when the service started, up to March, 1958, the total amount paid in compensation was just over \$2,500,000. In the first year of the service it was only \$21,170; in the last year it was \$325,170.

Punch Biopsy of Parietal Pleura.—Blind punch biopsy of the parietal pleura was used by Mestitz and co-workers for determining the nature of a pleural effusion or pleural shadowing of unknown cause (*Lancet* 2:1349, 1958). They described the results of 228 pleural biopsies made on 200 patients, most of whom had an effusion at the time of investigation, which was done whenever possible before treatment was given. Aspiration and punch biopsy were performed in one operation. The com-

plications encountered in the 200 patients were subcutaneous hematoma, pneumothorax, and secondary deposits along the needle track from a neoplasm. In addition to a full clinical examination including chest roentgenogram, the sedimentation rate, leukocyte count, and tuberculin reaction were determined; the sputum was examined for tubercle bacilli and malignant cells; and a differential leukocyte count, 48-hour culture, and culture or guinea-pig inoculation for tubercle bacilli in the pleural fluid were made. Histological examination of the biopsy material enabled the diagnosis of tuberculous pleurisy and malignant infiltration to be made. The method is simple and safe. Since it can establish the diagnosis in about 80% of tuberculous and 60% of malignant effusions, it is the most reliable diagnostic technique when tuberculosis is suspected. In the 228 biopsies there was only one false-positive diagnosis. Because this procedure may be the only way of making a definite diagnosis during life, it should be part of the initial investigation of every patient with a pleural effusion of uncertain cause.

Urge Medical Cards for All.—The British Medical Association is considering the desirability of all persons carrying a personal medical card which would give their blood group, immunizations they had received, whether they were allergic to penicillin or other drugs, and whether they were diabetics, needing insulin injections. The Central Consultants' and Specialists' Committee believes that such a card should be devised. It would be of particular value in those instances when a physician had to treat a patient who was unconscious and unknown to him. The 97% of the population registered with family doctors under the National Health Service (NHS) already has medical cards, but these do not include personal medical details. Even if such details were added, the few people who remain outside the NHS would still need such cards. Some patients, hemophiliacs, for example, already carry cards giving information about their condition. This is of great value when an emergency arises. "If the introduction of a personal medical card saved the lives of half a dozen people," said one doctor, "it would be well worth while."

Some physicians doubt whether each member of the public could be persuaded to carry such a card. They are opposed to any coercion of the public. A medical record such as that used in the Army, they say, would be too bulky. Advocates of the personal medical card agree that the public could not be compelled to carry it. It would be for each person to decide, but if he agreed, his family doctor could readily supply those facts which might prove life-saving in an emergency. The advantages and difficulties of such a scheme are being examined by the Association's science committee. Issue of a personal medical card would require the approval of the Ministry of Health, which would be guided by its professional advisers.

New Secretary for the British Medical Association.—Dr. Angus Macrae has retired as secretary of the British Medical Association and has been succeeded by Dr. Derek Stevenson, who has issued a pamphlet entitled "Lines of Communication" which he hopes will be a regular feature, and with which he hopes to keep in closer touch with members on the periphery of the Association. In the first number he discussed the present stages of the profession's negotiations with the government for increased rates of pay.

Drug Bill Up Despite Levy.—When the government increased the National Health Service medicine charge from 14 cents a prescription to 14 cents an item in 1956 as an economy measure, it anticipated a decrease of \$12,500,000 a year in its drug bill, but the bill has increased by more than \$4,000,000 a year. This was reported by Dr. J. P. Martin of the London School of Economics and Mrs. Sheila Williams in the *Lancet* of Jan. 3. With the new charge of 14 cents an item the number of prescriptions dropped from 5.51 per patient in 1956 to 4.93 in 1957, the lowest figure since the start of the NHS. The number of prescriptions per form also dropped, but the average cost of each prescription rose sharply from 66.5 to 81.5 cents. Nearly half this increase was due to doctors prescribing larger quantities of drugs. For chronic patients such as diabetics, at least, this practice had the support of the Minister of Health. The cost of charges to patients rose from an average of 46.5 cents in 1956 to 69 cents in 1957, and the proportion of the drug bill borne by patients rose from 12.26 to 17.07%. Though the number of prescriptions fell by nearly 20 million, the total drug bill rose by nearly 17 million dollars. The new charge brought in \$7,700,000 in revenue.

New Coagulant.—A new coagulant for treating hemophilia, antihemophilic globulin, consists of a white powder obtained from the blood of pigs and is nearly 20 times as potent in its antihemophilic properties as are human blood transfusions. So far the treatment can be used only once to save a patient's life, but there are hopes that soon a purified preparation will be available which can be used whenever it is needed.

Medical Ancillary Professions.—Last-minute opposition by physicians is likely to delay the achievement of state registration by physiotherapists, radiographers, chiropodists, and five other medical ancillary professions. The physicians claim that they have insufficient voice in the proposed scheme produced by the Ministry of Health. This scheme is the result of 10 years of investigation and negotiation. Leading the opposition to it is the British Medical Association, which says that no scheme would be acceptable which did not give the medical profes-

sion a greater influence in the training and ethical standards of the ancillary professions. The proposed scheme provides for a registration board for each profession, with a coordinating council governing them all. The B. M. A. and committees representing hospital consultants say that there should be more physicians on both the boards and the council. State registration would benefit both the professions concerned and the public. Only state-registered medical auxiliaries would be employed in the National Health Service.

Electrolyte Losses due to Purgation.—Coghill and co-workers (*British Medical Journal*, Jan. 3, 1959), starting with the axiom that diarrhea may result in excessive loss of serum sodium and potassium if the intake of these factors does not restore the deficiency, studied patients who had made a practice of taking purgatives regularly, resulting in persistent diarrhea, the drugs being those which act as irritants on both small and large intestines. The habit of taking cathartics is so widespread that it is remarkable that so few patients appear to suffer serious metabolic effects. Some persons developed chronic colitis, but others remained free of it even after 40 years of purgation, though chemical and radioisotope tests demonstrated electrolyte depletion in patients with symptoms such as profound muscular weakness, intestinal hypotonus bordering on paralytic ileus, and alkalosis associated with renal failure. Some who had developed ulcerative colitis did not regain good health until a section of the diseased colon had been removed, but those without a permanently inflamed intestine were much improved when the electrolyte loss was controlled.

Decoration of Anesthesia Room.—Dr. G. C. Steel, anesthetist to the Royal Free Hospital and other London hospitals for women, studied patients' reactions before being anesthetized (*British Medical Journal*, Jan. 3, 1959). He complains that the anesthesia room has tended to acquire the coldly utilitarian lines of the operating room and is frequently too small. A picture painted on the ceiling of the new anesthesia room at Chelsea Hospital for Women achieved its purpose of distracting apprehensive patients. It is a cheerful composite pastoral scene. Patients spread the news about the picture. One woman objected strongly to receiving her anesthetic in the corridor on the ground that she did not want to be done out of seeing the picture she had heard so much about. Only 10 of 100 patients did not notice the picture. Remarks on it were favorable (73), unfavorable (4), and noncommittal (23). The lighting is indirect, and thrown onto the ceiling. If premedication has been heavy, the effect of the mental diversion aroused by the picture is reduced.

CORRESPONDENCE

SEROLOGIC TESTS FOR SYPHILIS

To the Editor:—The persistence of syphilis as a major medical problem has stimulated continued serious study of all aspects of this problem. The article by Waring and associates, in *THE JOURNAL*, Dec. 13, 1958, page 2004, entitled "Biological False-Positive Results in Serologic Tests for Syphilis" does not, I feel, make a contribution to this problem because of serious defects in its planning and interpretation. The study reports that negative *Treponema pallidum* immobilization (TPI) test reactions were found in about 40% of 23 seroreactions referred for "diagnostic verification" on white patients. In 52 unselected Negro patients, no negative TPI reaction were found. One conclusion was that "the false-positive phenomenon is quite rare in the Negro race." No information is given in the article on the socioeconomic backgrounds of the two groups, though the boxed summary preceding the article states that the Caucasian patients "varied widely in socioeconomic background" and that the Negro patients were "thought to be a relatively homogeneous social and economic group."

If this bias in the selection of the two study groups was actually present, the difference in negative TPI rates could not be ascribed to racial factors. Another example of poor epidemiologic methods is the identification of these findings in 52 Negro patients with "the epidemiology of syphilis." Not only the small number of patients but their unrepresentative character for the general population exposed to syphilitic infection makes any statements concerning them valid only for them. It is hoped that better planned and controlled studies of all types will be forthcoming so that this important public health problem may soon be brought under complete control.

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To the Editor:—The small size of our study, commented on by Dr. Hyman, was acknowledged in the text; but we are prepared to retreat only in the face of larger numbers. The original study of the incidence of the false-positive reaction was the work of Moore (our reference 4), who deliberately chose white, upper income, private patients with positive reagin tests as his subjects. These persons were drawn from an area where syphilis is relatively less common than in other localities which might have been selected. False-positive reactions would therefore be expected more frequently than in samples of other social composition. It is eminently sensible to probe for a new phenomenon in a place in which

it is likely to be found. We believe that the false-positive problem has been over-emphasized, and our study was planned (i. e., biased) to provide a look at the other side of the picture. We believe that the habits of our Negro patients involved a higher than average frequency of exposure to infectious syphilis.

We do not believe, nor did we state, that our Negro patients (or, incidentally, Moore's white patients) represented the "general population exposed to syphilis" referred to by Dr. Gold. We join Dr. Gold in rejecting the view that "racial factors" are involved—at least as the physical anthropologist understands the term "racial." Finally, objections are raised to the observation that the biological false-positive is "quite rare in the Negro race" and the validity of our epidemiologic notions in general. So far as our small study goes, *res ipsae loquuntur*.

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THE PRACTICE OF MEDICINE IN CHINA

To the Editor:—It would be worthwhile for all members of the medical profession to read the article in the *Chinese Medical Journal* (77:413-426 [Nov.] 1958) concerning the management of burned patients from a Shanghai steel mill; it is entitled "The Fight to Save Steel Worker Ch'iu Ts'ai-K'ang's Life: A Summing-up Report by the Shanghai Second Medical College Committee of the Chinese Communist Party." This is the first time I have seen a medical journal devote a section to communist propaganda. The following excerpts from the article are self-explanatory.

The outcome of this struggle has proved, once again, that a proletarian party, and only such a party, is capable of leading every kind of work, including the extremely exacting science of medicine. . . . The Party committee of the Shanghai Second Medical College analyzed the ideologic state of the doctors, and correctly pointed out that what could not be done in capitalist countries we could do, and what the capitalist literature did not record we would record. This is possible because our social system and theirs differ. The people burnt there are the exploited workers. The capitalist whose only concern is for profits and more profits will most certainly not expend money and energy to save a worker. No more would the intelligentsia who serve the capitalists. . . . During the two months fight to save comrade Ch'iu Ts'ai-K'ang the leading role played by the party convinced the senior doctors and they acknowledged with all their heart that: "It's true that diseases can be treated by Marxism-Leninism," and that "without the Party intellectuals like us could not possibly have broken out from the established rules of bourgeois experts. . . ."

It was truly said that in this fight to save Ch'iu Ts'ai-K'ang, on the one hand the doctors cured Ch'iu of his burns, but on the other hand, through this curing the doctors them-

selves were cured: cured of their blind reverence for foreign authorities, their blind faith in textbooks, their doubts in the Party and in the masses, their unrealistic approach to problems. . . . Recently our college established departments to study hypertension, schistosomiasis and measles vaccination. In each of these departments there is a concurrent political head. Also communists and members of the Communist Youth League are in charge of the different research projects so as to expedite the intellectuals and their own proletarian remoulding and the advancement of their technology."

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CARDIAC EMERGENCY

To the Editor:—Dr. Carmichael's sketch with brief text in the Correspondence section of *THE JOURNAL* (169:176 [Jan. 10] 1959) has come to my attention. Since most cardiac standstills occur from myocardial failure due to rapidly progressive anoxia—stagnant, anemic, or histotoxic anoxia or an unfortunate combination of these—it might be well to dwell briefly on the vital issue of respiratory support. While Dr. Carmichael admits the proper sequence of events, he unhappily reverses this sequence at the bottom of his line cut, by placing "knife" over "airway." The need for respiratory support apparently is to be covered by providing a plastic airway, tacitly by-passing the issue altogether. What surgeon would think of opening the chest without the protection of an endotracheal tube, providing direct insufflation of the lungs with oxygen or air? Yet the patient about to die from hypoxia is expected to get along without this support. To maintain that an anesthetist is essential for the intubation of a flaccid patient is an attitude fatal to the success of cardiac massage. What, it may be asked, is the use of massaging a heart whose blood is bereft of oxygen? Having assisted in the training of more than 1,000 physicians, in the simple procedure of the direct intubation of the flaccid patient, I am satisfied that this preliminary to successful cardiac massage, with or without defibrillation, can be performed without difficulty.

In a technical procedure involving life and death, most of us hate to face the need to learn all about it at the time of our first exposure, and, yet, how many have seen the relaxed glottis, passed a tube into it, blown into this tube, and seen the lungs expand? How many have felt the relaxed heart in the hand, massaged it, and seen the blood pressure sustained and the rhythm restored by defibrillation? Such instruction, in an intensive form, with live clinical material is available and can be secured with but slight delay. Once the physician is experienced, this instruction provides a psychological and a medico-legal sense of security.

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LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Governmental Hospitals: Examination to be Given Emergency Patient.—This was an action for damages against the administrator of a county hospital for alleged negligent conduct in the hospital's emergency room. From a judgment in favor of the defendant, the plaintiff appealed to the Supreme Court of Florida.

The deceased, clad only in trunks, was found about 1:30 a. m. stretched out on the lawn of the Dean Hotel in Miami. He was described by the police officer who found him as "unconscious." The police officer also stated that he detected a "slight odor" of alcohol, although the ambulance driver said he noticed none at all. The intern in the hospital's emergency room testified that the man's chest sounds and pulse were normal and that although not unconscious he was incoherent and his breath literally reeked with alcohol. He stated that someone told him that the man had been "found on the street," but he did not undertake to obtain any history of the situation and no roentgenograms were taken. After what appears to have been a relatively superficial clinical examination the intern released the man to the care of a nurse who returned him to the hospital police room for delivery to the police as a drunk. About 3 a. m. the police carried the man to a patrol car and conveyed him to the municipal jail.

The police officer testified that the man slumped over on the seat of the automobile as if his "back were broken." When placed on the elevator to carry him up to the jail, the man couldn't stand up but slumped down on the floor. He was put into a cell on a metal cot and left to himself. About 7 a. m. that morning he was found dead, death having been caused by air and hemorrhaging in the thoracic cavity resulting from the piercing of the cavity by about nine broken ribs.

The plaintiff, administrator of the deceased's estate, contended that the death of the deceased was the result of the defendant's failure to use reasonable care and skill in the hospital emergency room; but the trial court felt that the relationship between the death and such alleged negligence was too remote and speculative.

The Supreme Court admitted that the science of medicine is not an exact one and that physicians are not to be held liable for honest errors of judgment. To hold a physician liable it must be shown that the course which he pursued was clearly against the course recognized as correct by the profession. The responsibility and degree of care imposed upon the defendant hospital, said the court, is to be measured by the responsibility and degree of care imposed upon its employees, the intern and nurses in

the emergency ward. Instead of discharging the deceased as drunk after 15 or 20 minutes, should the intern have pursued a more thorough course of inquiry and examination under the circumstances?

No history of the man's condition and no facts leading up to his delivery to the hospital were obtained at any time. No roentgenograms were taken. The hospital director testified that if a patient was unconscious and unable to give his name and state how he was injured when delivered to the hospital, then releasing him in the same condition would in his judgment fall below the standard of care required under the circumstances. The physician supervisor of the emergency room testified that if a patient in the condition of deceased were admitted and could not give a history of his condition, and one could not be obtained, then he would certainly taken roentgenograms in an effort to form a diagnosis. He also testified that the fact that the deceased had a normal pulse rate was inconsistent with a state of intoxication. The pathologist who performed the autopsy said he could not conclusively state whether the broken ribs and their puncturing of the chest cavity were the result of a suspected fall from the second story of the Dean Hotel or from the failure to hospitalize the deceased and from permitting him to be moved about after examination in the emergency room. He did testify, however, that permitting a man with nine broken ribs to be moved and shunted about certainly would aggravate his condition and expedite his death.

On the basis of all this testimony, the Supreme Court was of the opinion that there was adequate evidence of negligence in the treatment, examination, and ultimate diagnosis of the deceased's condition to justify submission of the case to the jury. The judgment in favor of the defendant hospital was therefore reversed and the cause remanded for a new trial. *Bourgeois v. Dade County*, 99 So(2) 575 (Fla., 1957).

Expert Witnesses: Criteria of Competence.—This was an action for damages resulting from the alleged negligence of the defendant physician in removing or in recommending the removal of a small piece of metal from the plaintiff's body. The trial court, at the close of the plaintiff's evidence, directed a verdict in favor of the defendant so the plaintiff appealed to the United States court of appeals, fourth circuit.

The plaintiff operated a garage. While he was holding a steel automobile axle as it was being struck with a sledge hammer by his helper a small sliver of steel flew off and penetrated the base of the plaintiff's neck on the left side, near the upper portion of his chest. After visiting various physi-

cians, the plaintiff finally consulted the defendant who recommended and then performed an operation to remove the particle. He was unable to locate it and it was not removed, but when the plaintiff awoke from the anesthetic his arm was numb and his hand useless. The sensory and motor paralysis in the plaintiff's arm became permanent.

One of the principal issues on appeal involved the admissibility in evidence of the testimony of one of the plaintiff's expert witnesses, Dr. Walker. After practicing general medicine in North Carolina for a number of years he took postgraduate courses in radiology and had engaged in that specialty for some nine years prior to the trial. He admitted that he had never done chest surgery and that in his general practice he had performed only minor operations. As a radiologist, however, he said that he came in contact with various types of surgeons in a consulting capacity, and he claimed to be acquainted with the generally approved practices among physicians and surgeons in North Carolina.

The trial judge, after full inquiry into Dr. Walker's education and experience, and with the opportunity and obvious disposition to appraise fairly the competency of the witness, permitted him to testify in respect to radiological matters. He allowed him to explain the uses of x-ray pictures, what they reveal, how they are employed by surgeons in determining the existence and location of foreign objects in the human body, and the correct interpretation of the roentgenograms made of the plaintiff. The judge did not, however, permit the witness to express opinions to the jury as to what constitutes proper surgical procedure in preparing for or performing chest operations.

The plaintiff contended that the exclusion of this testimony was reversible error because, if admitted, it would be sufficient to establish the standards of good surgical practice and make out a *prima facie* case of their violation.

The court of appeals held that the trial judge acted within the limits of his allowable discretion. He did not disqualify Dr. Walker as a matter of law because he was not a specialist in surgery but because, after weighing the witness' professional background and qualifications, the conclusion was reached that he had not shown sufficient familiarity with the subject upon which he was being interrogated to entitle him to express the opinion called for. The general rule, said the court, is that the qualification of a witness to express an expert opinion should be left to the sound discretion of the trial judge.

Dr. Walker's testimony, however, when coupled with the testimony of other of the plaintiff's expert witnesses, was sufficient to take to the jury the question of whether or not the defendant had failed

to exercise due care in the operation, or to use his best judgment in advising it. The court of appeals accordingly held that the directed verdict at the close of the plaintiff's evidence was improper, and the judgment in favor of the defendant was reversed and a new trial ordered. *Hunt v. Bradshaw*, 251 F (2) 103 (1958).

Malpractice: Consent for Operation.—This was an action for damages resulting from the alleged unauthorized performance of an operation by the defendant physician. From a judgment for the defendant the plaintiff appealed to the Supreme Court of Minnesota.

The plaintiff consulted the defendant physician in connection with various urinary problems from which he was suffering. After an office examination the defendant suggested that the plaintiff should enter the hospital in order that cystoscopic examination could be made. The defendant told the plaintiff "that the purpose of his going into the hospital was for further investigation with a view to making a prostate operation if the further examination showed that that was indicated." After the examination the next day the defendant performed an operation on the prostate gland during the course of which he severed the plaintiff's spermatic cords. The question was whether or not the consent to the prostate operation carried with it a consent to the severance of the spermatic cords.

The defendant testified that following the cystoscopic examination he went to the head of the table and talked to the plaintiff. He told him that a transurethral prostatic resection should be done and the plaintiff consented thereto. He admitted that he did not discuss any involvement of the spermatic cords although he did testify that severance of the spermatic cords is a routine part of this procedure in patients of the plaintiff's age. The plaintiff stated definitely that the defendant at no time told him that he was going to sever the spermatic cords. He admitted giving consent to the operation but insisted that the only thing he had in mind was his bladder because that was the reason for his consulting the defendant in the first place. The plaintiff also admitted, however, that he did not ask the defendant what he was going to do but left it up to him to do the right thing.

The general rule, said the Supreme Court, seems to be well established that before a physician may perform an operation on a patient he must obtain the consent either of the patient, if competent to give it, or of someone legally authorized to give it for him, unless an immediate operation is nec-

essary to save the patient's life or health. In our opinion, the court continued, where a physician can ascertain in advance of an operation alternative situations, and no immediate emergency exists, a patient should be informed of the alternative possibilities and given a chance to decide before the doctor proceeds with the operation. In a situation such as the case before us, where no immediate emergency exists, a patient should be informed before the operation that if his spermatic cords were severed it would result in his sterilization, but that if this were not done there would be a possibility of an infection which could result in serious consequences. Whether the plaintiff's consent was obtained was a question which should have been submitted to the jury. Accordingly, the judgment in favor of the defendant was reversed and the cause remanded for a new trial. *Bang v. Chas. T. Miller Hospital*, 88 N.W. (2) 186 (Minn., 1958).

Lie Detector: Admissibility in Evidence of Results of Test.—This was a prosecution for rape and from a conviction in the trial court the accused appealed to the district court of appeal, first district, division I, California.

During the direct examination of the defendant by his own attorney, the defendant indicated that the only time he had been out of his cell on a particular day was when he had been given a lie detector test which he had volunteered to take. On cross-examination the prosecutor went more fully into the subject of the lie detector, discovered that the defendant did not know the results of the test which had been made, and offered such results in evidence. The defendant's attorney objected to this tactic, and the court instructed the jury that the lie detector test had no place in the case and that they should disregard any reference to it. During the closing arguments the prosecutor again referred to the matter. On appeal the defendant contended that the conduct of the prosecutor constituted reversible error.

The court said there was no doubt that evidence concerning the results of the lie detector test was inadmissible. Evidence of an accused's willingness or unwillingness to take such a test is also inadmissible. Generally, the admission of such evidence is error, and such error is not cured by a warning to the jury. There would seem to be little doubt that the defendant's statement that he had volunteered for and taken such a test was inadmissible. Had the prosecution objected the objection should have been sustained, but the prosecution did not

object; instead, on cross examination, it inquired into the subject more fully and even offered to introduce in evidence the result of the test.

In so proceeding, said the court of appeals, the prosecutor undoubtedly committed error. The law is clear that legitimate cross-examination does not extend to matters improperly admitted on direct. Immaterial and irrelevant testimony cannot be brought before the jury under the pretense that it is legitimate cross-examination.

The court of appeals held, however, that since the jury had been amply warned of the law on the subject and since there was other strong evidence of defendant's guilt, the error committed in this case did not require a reversal of the judgment of conviction. *People v. Parrella*, 322 P(2) 83 (Calif., 1958).

MISCELLANY

CODE OF ETHICS FOR HOSPITALS

The American Hospital Association and the American College of Hospital Administrators have released a revised code of ethics for hospitals and hospital administrators. The new code supplants a code produced and adopted in 1939 by the two organizations.

The revised code of ethics follows:

1. Recognizing that the care of the sick is their first responsibility and a sacred trust, hospitals must at all times strive to provide the best possible care and treatment to all in need of hospitalization.

2. Hospitals, cognizant of their unique role of safeguarding the nation's health, should seek through compassionate and scientific care and health education to extend life, alleviate suffering, and improve the general health of the communities they serve.

3. Hospitals should maintain and promote harmonious relationships within the organization to insure the proper environment for the considerate and successful care and treatment of patients.

4. Hospitals should appreciate and respect individual religious practices and customs of the patient.

5. Hospitals, to the extent possible, should conduct educational projects, stimulate research, and encourage preventive health practices in the community.

6. Hospitals should cooperate with other hospitals, health and welfare agencies, governmental and private, and other recognized organizations interested in promoting the health of the nation.

7. Hospitals in reporting their work to the public should give a factual and objective interpretation of accomplishments and objectives without disparaging the work of other hospitals or related organizations.

8. Hospitals should actively support and encourage every effective method which will ease the financial burdens of illness.

9. Hospitals should be fair, honest, and impartial in all their business relationships.

10. Hospitals should be progressive in policies, personnel practices, and efforts to maintain up-to-date equipment, methods, and standards of performance.

The statement and revised principles of conduct for hospital administrators are as follows:

The hospital administrator's life is dedicated to the highest possible level of performance in the competent and humane hospital care of the sick, in health education in all its many phases, and in research conducted in the interest of hospitals and their patients. In pursuing these objectives the hospital administrator should be guided by the following principles.

1. He will not use his position or influence for selfish personal advantage or gain and will not disparage the work of his colleagues.

2. As the official representative of the hospital's governing body and often the hospital's spokesman in the community, his conduct will at all times be dignified and exemplary. His professional performance will be objective and fair, with the patient's best interest as the ultimate consideration.

3. In his relationships with personnel and staff he will be impartial, tolerant, fair, and interested in all reasonable means of promoting personnel morale and welfare consistent with the hospital's best interests and ability to provide them.

4. The administrator will encourage, assist, and teach others the principles and practice of hospital administration to end that future hospital administrators may be more adequately prepared.

5. The administrator will encourage and participate, to the extent possible, in a broad educational program to assure the health workers necessary to the hospital field.

6. He will contribute his interest, support, and leadership toward the general improvement of the community, with especial emphasis on health education and related causes. In so doing he will attempt to avoid involving his hospital in partisan political issues.

7. In his relationships with the medical staff of the hospital he will support that which is constructive, sound, and in the interest of good hospital professional practice; he will resist and oppose that which is, in his judgment, harmful, destructive, or unwise.

8. The administrator will seek constantly to improve his professional knowledge and skill and will accept counsel and guidance, particularly in fields and subjects with which he is not entirely familiar.

9. Recognizing that his is a position of public trust, he will, within the limitations imposed by good judgment, legal consideration, and his hospital charter respect the rights, privileges, and beliefs of others regardless of race, color, or creed. He will keep confidential whatever he may learn respecting the private affairs or character of patients and their families, physicians, and others with whom he is associated in the hospital. When his administrative duties bring him into conflict with any segment of society or belief, he will deal with the situation with the greatest consideration, courtesy, and respect for the individual that is possible, without ridicule or animosity.

10. He will exemplify the Golden Rule in thinking, action, and conduct.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Diagnosis of Amyloidosis by Renal Biopsy. W. W. Ward Jr. *J. Kentucky M. A.* 56:1226-1228 (Dec.) 1958 [Louisville].

The author reports on a 45-year-old woman with suspected primary amyloidosis and on 3 men, between the ages of 31 and 60 years, with suspected secondary amyloidosis, in whom the diagnosis was first established by percutaneous renal biopsy. Microscopic examination of renal tissue would seem to be a useful and rewarding procedure to confirm the diagnosis of amyloidosis, especially in the presence of abnormal urinary findings. This is particularly true when the nephrotic syndrome exists as a result of renal amyloidosis, since in patients with this syndrome both tubular and extensive glomerular involvement may be present. There were no complications resulting from renal biopsy in the 4 patients.

Prognostic and Diagnostic Value of Serum Glutamic Oxaloacetic Transaminase in Suspected Cardiac Infarction. K. D. Keele, F. Goulden and M. J. D. Newman. *Lancet* 2:1187-1189 (Dec. 6) 1958 [London].

The authors report on 129 patients with 135 attacks of retrosternal pain, in whom cardiac infarction was suspected when they were admitted "off the street" to the Ashford Hospital in Middlesex, England. Estimations of serum glutamic oxaloacetic transaminase (SGO-T) activity showed that the SGO-T activity is almost always increased between 24 and 48 hours after a myocardial infarct. Of 75 attacks of retrosternal pain proved to be due to cardiac infarction at autopsy or by the appearance of diagnostic electrocardiographic changes, only 2 were associated with an SGO-T activity of less than 50 units during this period, i. e., less than 3% of false-negative results. The height of SGO-T at its peak 24 to 48 hours after the onset of anginal pain proved to be closely correlated with the immediate mortality and the occurrence of heart failure. In 8

of 9 patients in whom cardiac infarction was diagnosed, a reading of over 300 units was associated with early death, the one exception being a 30-year-old man; of 20 patients with SGO-T between 200 and 300 units, heart failure or drop of systolic pressure below 100 mm. Hg occurred in 8 (40%), and 5 (25%) died within one month; of 57 patients with SGO-T below 200 units, heart failure occurred in 13 (23%), and 3 (5%) died. A false-positive result was found in 7 of 104 patients with raised SGO-T in this series. Anginal pain at rest with an abnormal but nonspecific electrocardiogram and raised SGO-T was found to carry the same prognostic significance as electrocardiographically proved infarction.

Pneumonia. H. J. Ustvedt. *Tidsskr. norske lægefor.* 78:1051-1055 (Nov. 1) 1958 (In Norwegian) [Oslo].

Pneumonia is a disease of the lungs due to a number of different infectious substances. The better prognosis for life today in pneumonia in younger and middle-aged persons is essentially due to the treatment, preeminently with antibiotics, although a general increase of resistance may have operated simultaneously. Pneumonia is a dangerous disease for infants, old persons, and persons with a chronic disease. The morbidity from pneumonia is thought not to have been so strongly reduced as the lethality. The two main groups of pneumonia are the bacterial pneumonias, usually influenced by antibiotics, and the pulmonary inflammations due to virus or assumed to be conditioned on virus infection, which apparently are not affected, or are but little affected, by antibiotics but which nevertheless mostly have a good prognosis. When the diagnosis of pneumonia has been made, treatment should be started at once. In 9 out of 10 cases of lobar pneumonia, pneumococci are present, and penicillin is the antibiotic to start with. If the picture is grave, there is increased likelihood of the presence of other bacteria, and streptomycin should also be given from the beginning. This can be expected to affect staphylococci, Klebsiella organisms, and Hemophilus influenzae. Routine bacteriological examination of the sputum in pneumonia is superfluous. It is far more important for treatment and prognosis to concentrate examination for other possible diseases which may be present. Only if the initial treatment fails and the disease continues to show moderate or considerable activity is bacteriological examination of the sputum advised. The penicillin-resistant staphy-

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lococci represent a problem rapidly increasing in significance. In countries such as England, where the staphylococcus problem is today more acute than in Norway, attention is increasingly directed to staphylococci as the cause of fulminant pneumonias, in part resistant to therapy and fatal.

Virus diseases which do not primarily attack the lungs may be complicated with pneumonia. Here the pneumonia will be mostly bacterial, and special attention must be paid to staphylococci. Of the virus diseases which primarily seem to attack the lungs, with pneumonia as a characteristic manifestation, probably only diseases due to the so-called psittacosis-lymphogranuloma venereum type are of practical importance. The so-called common cold virus appears to play a small part, if any, as the direct cause of pneumonia. A bronchial carcinoma sometimes manifests itself clinically by a complicating pneumonia. It is, therefore, important that pneumonias, especially in cigarette-smoking men, aged 40 to 50 years and over, be followed to complete resolution. Particularly in men, aged 45 or over, in urban areas, chronic or recurring bronchitis, with gradually diminishing respiratory reserve, is not uncommon. Such patients will show a lower resistance to pneumonia, and the value of prophylactic sulfonamide or antibiotic medication in the winter season might be investigated here.

Effect of Weight Loss on Blood Pressure. J. V. Salzano, R. V. Gunning, T. N. Mastopaulo and W. W. Tuttle. *J. Am. Dietet. A.* 34:1309-1312 (Dec.) 1958 [Chicago].

The authors studied the effects of a supervised reducing regimen on resting arterial blood pressure in 12 women, between the ages of 22 and 37 years, who were 14 to 85% above average weight, and in 4 men, between the ages of 24 and 32 years, who were 21 to 39% over weight. Nutritionally adequate diets were prescribed for each person, designed to produce a decrease in body weight of about 2 lb. (0.9 kg.) per week. The data obtained from these 16 persons before, during, and after weight reduction seem to justify the following conclusions. During the time observations were made after weight reduction, 13 (81%) of the 16 persons showed a significant decrease in systolic pressure, and 10 (62%) had a significant decrease in diastolic pressure. In 8 persons the systolic pressure was significantly reduced during the zero to 50% weight-loss phase, but during the reduction of the body weight to normal (50 to 100% excess weight-loss phase), 14 persons had a systolic pressure below their control values determined at the beginning of the study. Diastolic pressures were significantly less than control values during the zero to 50% excess weight-loss phase in 9 persons, but with the reduction of the body weight to normal, diastolic pressures were decreased from control values in

12 (75%) of the persons. On the basis of mean differences, there was a lowering of both systolic and diastolic pressure as the weight-loss program progressed.

The Course of Primary Hypertension in the Young. G. A. Perera. *Ann. Int. Med.* 49:1348-1350 (Dec.) 1958 [Lancaster, Pa.].

The 30 patients reviewed were selected from the records of the Presbyterian Hospital in New York. Hypertension had been established in all of them before they reached the age of 25 years, and continued follow-up studies had revealed diastolic blood pressure values of 90 mm. Hg or higher. There were 11 male and 19 female patients. The average age at the time of diagnosis was 20 years. The ages ranged from 10 through 24 years, 5 patients being 15 years of age or younger. The initial recorded blood pressure ranged from 140/90 to 200/140 mm. Hg, and bore no relationship to the subsequent course. The diastolic blood pressure at the time of diagnosis was 120 mm. Hg or higher in 7 of the group. Eight patients (3 men and 5 women) died after a mean survival period of 21 years; the duration of the disorder in the cases followed until death varied from 10 to as long as 40 years. The accelerated ("malignant") form of hypertension developed in 4 of these and was demonstrated at autopsy. Three patients died of a cerebral hemorrhage, and in one the cause of death could not be determined.

The 22 patients who are still alive have been followed for an average period of 20 years. Seven of 8 patients who have so far survived for more than 20 years are women. Five of the 22 survivors have had cardiac pain or signs and symptoms of congestive failure; 1 has had a cerebral vascular accident; 6 now have proteinuria, and 3 have recently been found to have regional hemorrhages. The remainder, save for cardiac hypertrophy in the majority, are free of demonstrable organic complications. Half of those who are still living complain frequently of headaches, nervousness, palpitation, or dizziness; the rest have no subjective symptoms. These findings do not support the view that hypertension is necessarily more severe when it is contracted in youth.

Rheumatic Disease and Uric Acid Blood Content. L. Schiavetti, A. Gospodinoff and A. Violanti. *Policlinico (sez. prat.)* 65:1725-1731 (Nov. 10) 1958 (In Italian) [Rome].

Uricacidemia was studied in 147 rheumatic patients, 32 with peripheral or vertebral rheumatoid involvement, 22 with gouty arthropathy, 66 with arthrosis, 8 with rheumatic fever, 6 with syndrome of the intervertebral disk, 6 with secondary rheumatic infection, and 7 with other forms of rheumatic disease, such as fibrositis and scapulohumeral

periarthritis. The group of patients with peripheral or vertebral rheumatoid involvement was composed of 20 women and 12 men. In the women, all between the ages of 40 and 55 years, on a normal diet the average value of uric acid content in the blood was 2.3 mg. per 100 cc.; only in one of them did this content reach 3.1 mg. per 100 cc. On a 10-day low-purine diet the average value of the uric acid content was 1.6 mg. per 100 cc., while with a high-protein diet the average value of the uric acid content was 2.9 mg. per 100 cc. The highest value of blood uric acid on a normal diet was 8.12 mg. per 100 cc.; on a low-protein diet this value diminished markedly and reached an average value. The average uric acid blood level in the men, all between the ages of 45 and 55 years, was 2.3 mg. per 100 cc. on a normal diet; only in one patient was this value as high as 6.2 mg. per 100 cc., and it became normal on a low-protein diet. Normal values of blood uric acid were found in 4 patients with vertebral rheumatoid involvement; changes occurring in these values proved to be independent of the diet. Considerable increase in the erythrocyte sedimentation rate occurred and was found to be in direct relationship with the clinical symptoms. No relationship was found between the erythrocyte sedimentation rate and the values of uric acid in the blood. Treatment with a proprietary preparation of isoniazid (Pyrizidin) and with prednisone had some good effect on the clinical symptoms and on the sedimentation rate, but had no effect on the uric acid blood content.

Of the 22 patients with gouty arthropathy, 14 were men and 8 were women. The men were between the ages of 41 and 65 years. On a normal diet the average value of blood uric acid was 6.8 mg. per 100 cc., and the minimum value was 5.6 mg. per 100 cc.; after 10 days of a low-purine diet the average value was 4.7 mg. per 100 cc.; on a rich purine diet the average value was 9.2 mg. per 100 cc., with a maximum value of 16.5 mg. per 100 cc. and a minimum value of 6.8 mg. per 100 cc. In the women, all between the ages of 50 and 70 years, the average value of blood uric acid on a normal diet was 5.9 mg. per 100 cc., with a minimum value of 4.7 mg. per 100 cc.; on a low-purine diet the average value was 4.5 mg. per 100 cc., and on a high-purine diet it was 8.6 mg. per 100 cc., with a maximum value of 12 mg. per 100 cc. Treatment with synthetic steroids had a marked effect on the uric acid blood level. Values lower than normal were found in the uricacidemia of the patients with rheumatoid disease, with the exception of patients with vertebral forms of rheumatism in whom marked oscillations were observed. High uric acid blood level was found in patients with arthrosis. A decrease in the values of uric acid and an improvement in the painful symptoms resulted from the administration of drugs favoring uricaciduria in patients with arthrosis and hyperuricacidemia.

Study of 1000 Cases of Asthma and Rhinitis. F. Grégoire and M. Comeau. *Canad. M. A. J.* 79:981-985 (Dec. 15) 1958 [Toronto].

The authors studied 679 patients with bronchial asthma, 230 with perennial rhinitis, and 289 with hay fever, representing about 55% of the 2,200 patients seen in 5 years at the Lavoisier Institute in Montreal. The majority of these patients were followed up and were hyposensitized by the family physician. These patients were asked to report on details about their medication and hyposensitization and to appraise the degree of improvement after discussion with the family physician.

Results showed that 78% of all the patients with bronchial asthma registered moderate improvement to complete remission, while the condition of 10% of the asthmatics was unchanged, especially that of the older age group, and another 12% showed only slight improvement. Functional tests on hospitalized patients showed that irreversible emphysema was one of the causes for lack of response. It is, therefore, suggested that patients with asthma be treated as early as possible and before irreversible emphysema develops. Almost 90% of the patients with perennial rhinitis and 95.5% of those with seasonal rhinitis (hay fever) showed improvement, most of them very substantially. This improvement rate could be increased further by better education of the patient and his family physician. Prophylaxis with antibiotics could be tried in infected patients, as is done in patients with rheumatic heart disease, but with antibiotics other than penicillin, because the latter might have a dangerous effect in allergic patients. Hyposensitization should be continued for at least 3 years and should not be stopped if the patient has had a recurrence of his symptoms in the last 2 years or if his skin tests are still strongly positive.

The Diagnosis of Gout: Significance of an Elevated Serum Uric Acid Value. J. C. Goldthwait, C. F. Butler and J. S. Stillman. *New England J. Med.* 259:1095-1099 (Dec. 4) 1958 [Boston].

In the period from 1949 to 1956, 225 patients whose serum uric acid levels were higher than 6 mg. per 100 cc. were studied and classified for diagnosis. The Archibald modification of the Kern-Stransky method was used for determination of the serum uric acid content. Seventy-eight of the 225 patients gave a classic history of gout: acute attacks of arthritis with symptom-free intervals between attacks. In 26 patients a diagnosis of gout was made, although the course of the disease as well as symptoms and physical abnormalities were not characteristic of gout; in each patient at least one criterion for the establishment of this diagnosis was fulfilled in addition to the presence of hyperuricacidemia. Thirty-two of the 225 patients had rheumatoid arthritis, and it was predominantly associated with

hyperuricacidemia in the 22 men. The initial serum uric acid levels were not as high in patients with rheumatoid arthritis (mean, 6.6 mg., and ranging from 3.4 to 9.7 mg. per 100 cc.) as in those with gout (mean, 7.8 mg., and ranging from 4.8 to 16.0 mg. per 100 cc.). Roentgenologic examinations of the hands and feet of 26 patients showed in 4 patients "punched-out" lesions in the bones of these areas. Twenty-three patients were classified in the category of atypical rheumatoid arthritis.

Twelve patients in this series of 225 had psoriasis. The disease of the joints in 3 consisted of acute episodic symptoms which responded well to colchicine administration; therefore, these patients were classified in the group with gout. The condition of one patient was diagnosed as atypical gout; although the physical symptoms were typical, the history (6 months of subacute pain and swelling in the ankles and toes) and the reaction to therapy were not typical of gout. Eight patients were considered to have rheumatoid arthritis. Forty-seven patients were classified as having diseases unrelated to gout or rheumatoid arthritis. Thus, of the total group of 225 patients with hyperuricacidemia, the diagnosis of gout was made in 113. The remaining 112 patients either presented some well-defined entity other than gout or rheumatoid arthritis, or the findings were not susceptible to a diagnostic label. Hematocrit determinations were made on 109 patients; the hematocrit reading was higher than 45% in 33, and this was associated with persistent leukocytosis in only 1 patient. Splenomegaly was not found in any of these patients. Neoplastic diseases of the bone marrow, such as leukemia or myeloma, were not found in any patient of this series.

Some Observations on the Management of Thyroid Disease. W. A. Seldon. M. J. Australia 2:637-638 (Nov. 8) 1958 [Sydney].

A survey was made of the previous therapy received by 507 patients with goiter seen at a private clinic during the years 1956-1957. This number did not include patients with carcinoma of the thyroid or thyroiditis. The definitive diagnosis was nontoxic goiter in 377 of the patients, and the remaining 130 were thyrotoxic. The number of patients receiving "thyroid-affecting" drugs was 129 (or 25%). Patients were placed in this category if they had received iodine, iodides, or thyroid extract within 2 months prior to being seen, or if they had taken antithyroid drugs, chiefly Neomercazole or methylthiouracil, within 3 months before they attended.

It has been recognized since the inception of radioiodine (I^{131}) uptake testing that previous iodine medication will interfere with normal uptake by the gland. The time taken for this effect to wear off depends on the iodine dosage, the length

of time it has been administered, and the degree of activity of the gland. Experience has also shown that overdosage with antithyroid drugs in normal or thyrotoxic subjects will cause a falsely high result from the I^{131} uptake test. This test and the estimation of serum protein-bound iodine are the sheet-anchors of laboratory investigation of thyroid disease. The estimation of serum protein-bound iodine is a difficult technical procedure which can be done only in specially equipped laboratories. With modern techniques of measurement of gland uptake of I^{131} , a clear-cut separation of hyperthyroid, euthyroid, and hypothyroid subjects can be obtained.

Of the 130 patients whose condition was finally diagnosed as thyrotoxic, 49 (31%) were receiving antithyroid drugs when first seen. In some cases this did not matter, as the disease was florid and the diagnosis obvious. However, in a number of instances it was impossible to decide whether the patient had well-controlled thyrotoxicosis or whether one was dealing with an euthyroid patient who had been given antithyroid therapy with resultant compensatory hyperplasia of the gland. In the latter case the thyroid enlarges and develops a bruit from increased vascularity, so that it is indistinguishable from the goiter of Graves's disease. Of the 377 patients with nontoxic goiter, 34 (9%) were receiving antithyroid drugs. This was due to the presence of a coincidental anxiety state, which produced symptoms superficially resembling thyrotoxicosis. This diagnostic error is easily made but could be avoided simply by the use of uptake tests before instituting therapy. An estimation of the basal metabolic rate is of no value in these instances, as it usually gives a high result.

In the treatment of nontoxic goiter, thyroid extract and thyroxin are the quickest and most efficient drugs, and yet they had been given to only 3% of the patients. If care were taken to give enough of these drugs to suppress iodine uptake by the gland, the author never failed to obtain decrease of the goiter within 6 months. Even nodular goiters will diminish in size with this therapy. With such an effective form of treatment available, there is no reason for persisting with iodine therapy in nontoxic goiters, and its use should be abandoned.

Buccal Mucosal Tests in Patients with Canker Sores (Aphthous Stomatitis). L. Tuft and L. S. Girsh. J. Allergy 29:502-510 (Nov.-Dec.) 1958 [St. Louis].

Recurrent canker sores (aphthous stomatitis) are common in children and young adults, but their etiology is not known. Allergic etiology has been considered but has not been proved. There is general agreement, however, that excessive ingestion of such foods as citrus fruits, melons, tomatoes, vinegar, wine, chocolate, and nuts (walnuts) seems to play a role in the formation of the ulcers. Other

suggested etiologies include (1) avitaminosis, since improvement at times follows vitamin B or vitamin C therapy, and (2) bacterial infections, since diplococci and streptococci are found in cultures from the lesions. The canker-sore lesions begin as small, single or multiple, yellow-gray papulovesicles, 2 or 3 mm. in size. These lesions are quite sensitive. Within a few hours they change into tender ulcerations, which is the way they usually appear by the time they are inspected. The sites most often involved include the buccal mucosa, the edges of the tongue, the gingivae, and the palate. The oral lesions appear in successive crops at irregular intervals. They heal without scarring in a week or two. In 1956 Tuft and Ettleson reported the results of a clinical study of an allergic patient who had recurrent canker sores of the mouth for many years. They were able to reproduce these ulcers by direct application of citric acid and acetic acid to the buccal mucosa, and thus they proved the etiological relationship of these agents to the canker sores. Their results prompted further investigations into the possibility of utilizing this method of testing as an aid in etiological diagnosis not only in patients with canker sores but perhaps also in those with other forms of allergy to food or drugs.

The authors describe studies on patients with recurrent canker sores. Various methods were tried, and the following method was evolved. The authors placed 0.5 cm. of testing material, if crystalline (as in the case of citric acid and tartaric acid), or a 0.5-cm. cotton pledget saturated with the liquid organic acid (as in the case of acetic acid, vinegar, or lactic acid) on the anterior buccal mucosa on either side of the frenulum of the lips and as far laterally (1 cm.) from the frenulum of the lower lip as possible in order that 2 tests could be done at one time. The test material was removed at the end of 3 minutes. Only 4 organic acids, citric, acetic, tartaric, and lactic, were tested, since these are commonly found in foods. Citric and tartaric acids were tested in powder form. Acetic acid was tested as a 5% solution or as vinegar. Lactic acid was tested as 0.1 N solution (pH 2.4), which approximates the concentrations usually used in food recipes.

The test was found diagnostically useful in patients subject to recurrent canker sores. The condition was reproducible in 6 of the 46 patients with canker sores tested with citric acid and in 4 of the 35 patients tested with acetic acid. Tartaric acid and lactic acid gave negative tests and were not considered of etiological importance. A history of canker sores was much more frequent in allergic patients than in nonallergic control patients. None of the nonallergic patients in the control group had a positive reaction, that is, a canker sore as a result of the test. The utilization of this method of testing in the diagnosis of food allergy in skin-test-negative patients and in drug allergy is indicated.

Hepatitis and Cirrhosis in Women with Positive Clot Tests for Lupus Erythematosus. L. G. Bartholomew, A. B. Hagedorn, J. C. Cain and A. H. Baggenstoss. *New England J. Med.* 259:947-956 (Nov. 13) 1958 [Boston].

Lupus erythematosus has rarely been regarded as a potential etiological factor in patients presenting prolonged jaundice. The purpose of this study is to describe a group of women who presented not only prolonged jaundice with evidence of grave impairment of the liver but also hypergammaglobulinemia, L. E.-cell phenomenon, and clinical evidence of diffuse lupus erythematosus. The 7 women were observed at the Mayo Clinic. Scrutiny of their clinical histories indicated a disease of multiple systems and of long duration. The involvement of the liver, although a major manifestation, invariably occurred late in the course of the illness. Four of the 7 women were less than 25 years of age. Early in the course of the disease, episodic and migratory joint manifestations, including pain, swelling, and redness, were prominent in 5 of the 7 patients. Three of these 5 patients had joint symptoms so severe that prolonged steroid therapy was required, and a 4th patient had been treated with phenylbutazone. The remaining 2 patients had a history of significant arthralgia. Recurring episodes of unexplained fever had been recorded in 6 of the patients. Typical pleuritic pain was noted in the history of 4 patients. Repeated examinations of the urine in 6 of the 7 cases demonstrated the sporadic occurrence of albuminuria, microscopic hematuria, and cylindruria. Five of the 7 patients manifested either a definite sensitivity to sunlight or an unusual susceptibility to drugs. Intermittent, transient erythematosus or urticarial eruptions were noted in 3 patients during an exacerbation of joint pains. Four of the 7 patients had more than the usual amount of acne. All 7 patients had anemia. For periods varying from a few months to several years, episodes of unexplained weakness and excessive fatigability had occurred in all these women. These patients had been under medical management for these various manifestations for periods ranging from 6 months to 13 years. It was the recent development of jaundice or some other evidence of hepatic decompensation that seemed to precipitate the terminal phase in those who died of their systemic illness.

For varying periods before the evidence of hepatic disease appeared, these patients presented protean symptoms consistent with the clinical diagnosis of disseminated lupus erythematosus. At the time when objective evidence of grave disease of the liver was evident, they presented, in general, the unusual clinical picture of apparent well-being, strikingly different from that ordinarily expected in other forms of serious disease of the liver. The outstanding laboratory findings included marked

hypergammaglobulinemia, positive serologic reaction for syphilis, extreme elevation of the sedimentation rate, and abnormal urinary sediment. Among the tests of hepatic function that gave unequivocally abnormal results were the thymol turbidity and cephalin-cholesterol flocculation tests and the determinations of serum albumin, prothrombin time, and serum bilirubin. The typical cells of disseminated lupus erythematosus were repeatedly demonstrated in the serum or bone marrow in every case. In the cases in which the authors were able to examine the liver histologically, the lesion resembled that of acute and subacute viral hepatitis in 3 cases and postnecrotic cirrhosis in 2 cases.

Pneumonia Complicating Asian Influenza. N. C. Oswald, R. A. Shooter and M. P. Curwen. *Brit. M. J.* 2:1305-1311 (Nov. 29) 1958 [London].

The clinical and pathological records and roentgenograms of 165 patients with pneumonia complicating influenza, admitted to the 10 London undergraduate teaching hospitals in the autumn of 1957, were reviewed. Of these, 20 (12%) were instances of staphylococcal pneumonia. In order to compare staphylococcal and nonstaphylococcal pneumonia, the 20 patients with staphylococcal pneumonia were extracted from the teaching hospital series and added to those from nonteaching hospitals, so that comparison was possible between 145 cases of nonstaphylococcal pneumonia from teaching hospitals and 155 cases of staphylococcal pneumonia from a large number of hospitals in and near London. The serious consequences of secondary infection by *Staphylococcus pyogenes* var. *aureus* was proved by the fact that there were 44 deaths (28%) among the 155 patients with staphylococcal pneumonia, and 18 deaths (12%) among the 145 patients with nonstaphylococcal pneumonia. The clinical features also confirmed the virulent nature of staphylococcal pneumonia. Compared with nonstaphylococcal pneumonia, it caused a severer and longer illness, with a higher and more prolonged fever, roentgenologic evidence of more extensive pulmonary involvement, and, most important of all, a high mortality among children and young adults.

Experience during this epidemic left the question of the choice of antibiotics for routine use to some extent unsolved. The majority of patients overcame their pneumonia uneventfully, and penicillin and tetracycline appeared to be equally effective. The problem lay with the 10 to 15% of patients in whom staphylococcal pneumonia developed. Patients treated at home in the first instance, as were one-third in this series, may reasonably be given penicillin or tetracycline in the knowledge that it is suitable for nonstaphylococcal infections, and will rapidly resolve about one-half of the

staphylococcal infections. Once patients have been admitted to hospital, close cooperation with the laboratory is necessary, so that staphylococci may be identified and their sensitivities reported. This system was in use in many hospitals taking part in this investigation, and accounts partly for the frequent changes in antibiotic therapy within 48 hours of admission in the staphylococcal series. Many of the patients had features which are associated with a grave prognosis, such as mental changes, prostration, pallor, cyanosis, and excessive dyspnea. In a number of instances the influenza was superimposed upon other diseases—for example, chronic bronchitis and cardiovascular disorders.

In order to enlarge the experience of these more formidable aspects, a further 79 cases of nonstaphylococcal pneumonia were added to the staphylococcal and nonstaphylococcal groups compared above, making 379 cases altogether. Some of the additional 79 cases were thought originally to be instances of staphylococcal pneumonia and represented a selected group with severe infections. A diagnosis of fulminating influenza is often made in patients whose clinical features are alarming and in whom toxemia is extreme. Perhaps the outstanding qualities of fulminating influenza are the short duration of the acute illness and the severe degree of toxemia, so that effective treatment to combat collapse must be given quickly. In addition to oxygen therapy, administration of antibacterial drugs, and the maintenance of a clear airway, the possibility of steroid therapy arises, the value of which in the present epidemic produced conflicting opinions. There were 27 patients who received steroid therapy in adequate dosage, usually 100 mg. of hydrocortisone intravenously, followed by 50 mg. at 6-or-12-hour intervals; of these, 17 died. The relative importance of obstructed airway, loss of effective alveolar surface, and toxemia could not be accurately assessed. Also, 8 of the deaths occurred within 24 hours of admission to hospital. However, the impression is that the survivors were those with a reasonably free airway and comparatively little roentgenologic evidence of consolidation. These responded promptly to a combination of hydrocortisone and antibiotics.

Intermediary Ammonia Metabolism During Hepatic Coma: Significance of Blood Ammonia Determination as an Aid for Diagnosis and Management of Patients with Cirrhosis. C. S. Lieber and A. Lefèvre. *Acta clin. belg.* 13:328-357 (July-Aug.) 1958 (In French) [Brussels].

The level of serum ammonia in the arterial and venous blood was determined by means of modified Conway method with 180 blood samples obtained from 7 patients with hepatic cirrhosis, from 16 patients with various other diseases, and from a control group consisting of 7 healthy persons. In

cirrhotic patients with impending coma or in actual hepatic coma, the ammonia level of the arterial blood was found to be significantly higher than that of the venous blood. According to these findings, the ammonia level of the arterial blood correlated better with the degree of psychic disturbances than did the ammonia level of the venous blood. The blood ammonia level remained almost normal in patients who were in comatose state due to other diseases (uremia, cerebral thrombosis), and there was no significant difference between the average arterial and the average venous blood ammonia levels in normal persons. Moreover, there was no change in the condition of cirrhotic patients in whom the levels of arterial and venous blood ammonia were measured before and after complete removal of the ascitic fluid, and there was no rise in ammoniemia in any of these patients after the latter procedure. It was detected, however, that the concentration of ammonia in the ascitic fluid was entirely different from that in the peripheral venous blood.

The significance of the difference between the ammonia level of the arterial blood and that of the venous blood and the pathogenesis of hepatic coma associated with disturbances in intermediary ammonia metabolism are discussed. The authors stress the importance of blood ammonia determination in that it offers differential diagnosis of a coma of hepatic origin from a coma of nonhepatic origin and, furthermore, makes it possible to adjust the protein intake to the individual tolerance of each cirrhotic patient. Restriction of protein ingestion not only is useful as a preventive treatment for impending coma and actual hepatic coma but also causes improvement in more chronic psychic disturbances sometimes occurring in patients with severe cirrhosis. The low-protein diet and the administration of antibiotics, however, do not prevent the occurrence of complications usually associated with cirrhosis, the most frequent being gastrointestinal hemorrhage.

Lucerne as a Cause of Respiratory Allergy in South Africa. D. Ordman. *South African M. J.* 32:1121-1122 (Nov. 22) 1958 [Cape Town].

Lucerne, a perennial legume, is one of the principal crops in the Union of South Africa and is grown almost exclusively for hay. It is a good source of protein and mineral matter and is used as a feed for all classes of livestock, for which purpose it is often ground to meal. Lucerne may cause vasomotor rhinitis and bronchial asthma, especially when it is handled in the dry state during baling of the hay or when it is milled into powder. In the farming districts of the Orange Free State, where lucerne respiratory allergy is not uncommon, it has been observed that children, mainly boys, 5 to 10 years of age, develop mild

urticaria after helping in the lucerne fields. In 1952 the realization that allergic sensitivity to the inhalation of lucerne dust was of significance stimulated a close study of each case that subsequently came to notice. Information about the patients was obtained largely by correspondence with the physicians concerned. In this way, from 1952 to 1957, reports were received of 38 patients with a clinical sensitivity to the inhalation of lucerne dust (confirmed by skin testing in 18 cases where this was done). In 23 patients the sensitivity was to lucerne alone, and in the other 15 there was a coexisting sensitivity to one or more cereals.

Among 24 lucerne-sensitive patients whose occupation could be ascertained, there were 16 farmers, 3 agricultural students working on farms, 3 workers in grain stores or mills, and 2 school children. Lucerne extracts were issued to physicians for desensitizing purposes in 30 treatment sets, either alone (19), together with a single cereal extract (6), or together with 2 or more cereal extracts (5). Details are given of 6 cases of lucerne sensitivity in patients with symptoms of respiratory allergy, in whom desensitization with lucerne extract was carried out and in whom the results of desensitization could be assessed. Specific desensitization in respiratory allergy due to the inhalation of lucerne dust is shown to be very satisfactory.

SURGERY

Direct-Vision Coronary Endarterectomy for Angina Pectoris. W. P. Longmire Jr., J. A. Cannon and A. A. Kattus. *New England J. Med.* 259:993-999 (Nov. 20) 1958 [Boston].

The authors report on 5 men, between the ages of 38 and 54 years, who had suffered incapacitating anginal pain and underwent coronary endarterectomy under direct vision. All the patients had coronary atherosclerosis and typical symptoms of angina pectoris without definite evidence of myocardial infarction; they were selected for surgical intervention in the hope that the intact myocardium would tolerate the stress of operation better than an extensively damaged one and that maximal symptomatic improvement might be expected by an increase in the flow of blood to the undamaged myocardium. In all the patients it has been possible to remove an almost totally occluding, thickened intimal core from one or more of the main coronary vessels and to reestablish the blood flow through the vessels at the time of the operation. Asystole occurred near the completion of the operation in one patient who died despite vigorous application of all usual resuscitative measures. The 4 surviving patients, who were followed up for 2 or 3 months postoperatively, showed marked improvement in the electrocardiographic tracings which were obtained during a treadmill exercise test. Two

of the 4 patients have been completely relieved of their anginal pain, and the frequency and intensity of the anginal attacks have been greatly reduced in the other 2 patients. These results indicate that it is technically feasible by this surgical procedure to reestablish the blood flow in previously obstructed major coronary arteries. Experience with additional patients and longer postoperative follow-up will be necessary to make a final assessment of the value of the procedure.

The Surgical Correction of Calcific Aortic Stenosis in Adults: Results in the First 100 Consecutive Transaortic Valvuloplasties. D. E. Harken, H. Black, W. J. Taylor and others. *J. Thoracic Surg.* 36:759-776 (Dec.) 1958 [St. Louis].

The authors report on 71 men and 29 women, 38 of whom were between the ages of 51 and 66 years, who were operated on for symptomatic aortic stenosis. Surgical correction was carried out by a transaortic digital manipulation of the valve employing an Ivalon sponge operating tunnel. Of the 16 operative deaths, 5 occurred in the last 60 patients, representing a mortality rate of 8%. Of the 84 patients who survived the operation, 12 died within 1 to 31 months after the surgical intervention. Congestive heart failure was the predominant cause in 6 of these. Of the remaining 72 survivors, 50 have been followed for from 6 to 36 months; clinical appraisal of these 50 survivors indicates that the conditions of 43 (86%) are improved. Hemodynamic evaluation by left heart catheterization before and after the surgical intervention showed that the valve area has been significantly increased, that the mean systolic gradient has been reduced, and that the work performed by the left ventricle has been reduced. Serious consideration of surgical relief is advised in all patients with symptomatic aortic stenosis. A plea is made for careful preoperative and postoperative clinical and hemodynamic evaluation of patients with aortic obstruction. This should facilitate the proper choice of closed or open operation in the various patterns of disease.

Pulmonary Resection in the Treatment of Tuberculosis: Experience with 1,730 Patients. R. J. Barrett, H. S. Neal, J. C. Day and others. *J. Thoracic Surg.* 36:803-817 (Dec.) 1958 [St. Louis].

The authors performed 1,769 pulmonary resections on 1,730 patients with pulmonary tuberculosis at the Herman Kiefer Hospital in Detroit between Nov. 1, 1949, and Dec. 31, 1957. The current status is known in 91.4% of the patients. Detailed data have been presented on the last 1,567 resections performed on 1,528 patients. Of the 1,567 resections, 100 were pneumonectomies; 787, lobectomies; 579, segmental resections; and 101, wedge or local excisions. The operative mortality was 2.9% and

the late mortality 1.9%—a total mortality rate from all causes of 4.8%. There is still active disease in 3.8%. The incidence of bronchopleural fistula was 6.2%. Relapse occurred in 83 patients, a total incidence of 5%. Four (4.8%) of the 83 patients died, and 51 (62%) still have active disease. The seriousness of positive sputum at the time of operation was reflected in a significantly higher morbidity and mortality rate. Despite this higher operative risk, the continued use of resection in patients with extensive disease, in whom the prognosis is otherwise grave, appears justified with due regard to the limitations imposed by lowered pulmonary function, emphysema, and advanced age. During the past year, 297 resections have been performed, with a total mortality of only 1.3%, or less than half the mortality rate of the entire series.

Surgical Treatment of Thirty-five Cases of Drainage of Pulmonary Veins to the Right Side of the Heart. H. T. Bahnson, F. C. Spencer and C. A. Neill. *J. Thoracic Surg.* 36:777-802 (Dec.) 1958 [St. Louis].

The authors report on 35 patients, between the ages of 3 months and 45 years, with anomalous pulmonary venous return, in 16 of whom all the pulmonary veins drained to the right side. These patients, who underwent surgical treatment for their cardiac defects, represent 38% of the 92 patients treated during the past 9 years for left-to-right shunt at the atrial level. Partial anomalous drainage into the right atrium can be readily treated with modification of the techniques used in repair of the simple atrial septal defects. For this the authors used hypothermia, inflow occlusion, and suture under direct vision and were satisfied with this method in treating 10 patients, in 1 of whom all pulmonary veins entered the right atrium. Of 15 patients with drainage into the right superior vena cava, the latter vessel was partitioned in 11 to direct the pulmonary venous blood to the left side through the atrial defect, which then was closed under direct vision with the aid of inflow occlusion and hypothermia. All the patients treated by this method obtained a good result.

Cardiopulmonary bypass was used in treating successfully 2 patients with total pulmonary drainage into the coronary sinus. The third patient with this anomaly, an infant who was operated on with the aid of hypothermia, died, partly because the correct diagnosis was not made before death. In the remaining 7 patients, all pulmonary veins entered the left superior vena cava. Anastomosis of the left inferior pulmonary vein to the atrial appendage was performed on 1 patient, anastomosis of the left atrial appendage to the venous trunk was performed on 2, an aortic graft was used to join the left atrium and venous trunk in 1, and transposition of the right superior vena cava to the

foramen ovale was attempted in 1; all these patients died. Cardiopulmonary bypass was used to treat the last 2 patients, an infant and an adult with pulmonary drainage into the left superior vena cava; the infant died, but the adult obtained a good result. In patients with total pulmonary drainage into the coronary sinus or into the left superior vena cava, cardiopulmonary bypass is considered essential to allow adequate time for exploration and treatment, a conclusion supported by the poor results obtained with other methods used in earlier cases.

Seven Years' Experience with Transventricular Aortic Commissurotomy. R. P. Glover and H. L. Gadboys. *J. Thoracic Surg.* 36:839-856 (Dec.) 1958 [St. Louis].

The authors report on 78 patients, between the ages of 4 and 57 years, with aortic stenosis, who were operated on at the Presbyterian Hospital in Philadelphia between 1951 and 1957. Seventy of the 78 patients had moderate to marked calcification of the aortic valve, and 13 had permanent atrial fibrillation. The first 37 patients were operated on with the aid of a now outmoded technique employing a large, three-bladed, expandable split-dilator inserted through a widely purse-stringed avascular area near the apex of the left ventricle; 17 of the 37 patients died, representing an operative mortality of 46%. The remaining 41 patients had split-dilatation of the aortic valve by a greatly refined method with use of a light but exceptionally strong dilator, the expandable head of which was equipped with 2 parallel blades, rather than 3 as were formerly used; 2 of the 41 patients died, representing an operative mortality of 4.9%. The average systolic peak gradient across the valve was reduced from 78 mm. Hg to 27 mm. Hg. There were 15 late deaths, 8 in the earlier group and 7 in the group operated on by the present operative technique. Thirty-four patients (12 of the 37 operated on by the older technique and 22 of the 41 operated on by the new technique), who had survived the operation for more than one year, were definitely improved by it. Until the diseased aortic valve can be totally removed and replaced, the transventricular approach seems to offer the best form of surgical palliation with the least possible risk.

Hydatid Cyst of Posterior Aspect of the Left Ventricle: Pathologic Q Wave. R. Di Bello, R. Rimini and A. Roca Estevez. *An. Fac. med. Montevideo* 43:59-66 (May-Aug.) 1958 (In Spanish) [Montevideo, Uruguay].

Hydatid cyst of the heart is more frequent than is believed. Rupture of the cyst in the heart causes massive passage into the blood of allergens from

the cystic material, with consequent severe anaphylactic reactions, implantation of multiple visceral metastases, and arterial embolization. Rupture of the cyst into the pericardium causes secondary pericardial hydatidosis, with consequent pressure upon the atriums and upon the large blood vessels and the same severe allergic, metastatic, and embolic phenomena as those caused by the primary cyst. A woman, 60 years old, complained of pain in the left hemithorax of 4 months' duration. There was no history of cardiac disease in the patient's family. Roentgen-ray examination of the chest showed deformation of the shadow of the lower border of the left heart and pathological shadows on the left ventricle and the lower cardiophrenic angle. Abnormalities of the electrocardiogram included the characteristic inverted T coronary wave and a pathological Q wave in the leads which corresponded to the locations of the hydatid cyst. At operation a cyst was noted on the posterior surface of the ventricle, as well as symphysis of the pericardium and calcification of the pericardial serosa. These were interpreted as signs of rupture of the hydatid cyst 4 months before the operation, when local pain started. The operation consisted of evacuation of the cyst, resection of the cystic wall, and antihydatid toilet of the involved region of the ventricular wall. A drainage was left in situ for 40 days. The postoperative period was uneventful. A follow-up over a 2-year period has shown that the patient is in satisfactory condition.

Thoracic Fibromas. H. Hilke and R. M. Konrad. *Arch. klin. Chir.* 290:48-63 (no. 1) 1958 (In German) [Berlin].

Among the benign tumors of the thorax, the fibrous neoplasms have a special status as regards origin, classification, and potential malignancy. The authors discuss thoracic fibromas on the basis of observations on 11 patients with these tumors observed at the clinic of the Medical Academy of Düsseldorf, Germany. They found records of 166 intrathoracic fibromas (including their own) in the literature available to them. Intrathoracic fibromas may originate from the connective tissue of the thoracic wall, from the mediastinum or its organs, from the supporting tissue of the lungs, and from the connective tissue of the bronchial wall, but fibromas develop most frequently from the visceral or the parietal pleura. In the case of the small fibrous tumors classification as regards origin causes little difficulty, and if these tumors have pedicles with a profuse blood supply, their origin can likewise be readily ascertained. Pedicle formation is particularly characteristic of the intrathoracic fibromas that originate from visceral or parietal pleura on the thoracic wall, but it has also been observed in fibromas that originate from the mediastinal side of the sternum or from the pericardium.

Eight of the 11 thoracic fibromas observed by the authors were pleural fibromas. The histological findings in these 8 cases are presented. Two of the remaining 3 patients had mediastinal fibromas, and 1 had endobronchial fibroma.

The symptomatology of thoracic fibromas is largely identical with that of other benign intrathoracic tumors. A definite preoperative diagnosis is possible only in the case of the endobronchial fibromas, because here exploratory biopsy is possible. The treatment should be surgical, not only because of the possibility of malignant degeneration but also because these tumors may interfere with vital functions by causing displacement of mediastinal organs. The prognosis after radical extirpation of the tumor is favorable, but recurrences have been reported. In 5 of the 8 reported cases of pleural fibroma in which follow-up studies were carried out as late as 8 years after the operation, no recurrences were observed.

The authors point out that American investigators have suggested that a pleural fibroma (circumscribed fibrous mesothelioma) should be differentiated from other intrathoracic fibromas because of a characteristic pleomorphism. The authors feel that they cannot accept this stand because the 8 pleural fibromas they observed showed the typical structures of benign fibromas. Of the 166 intrathoracic fibromas reviewed, 68 were on the visceral pleura, 24 on the parietal pleura, 50 in the mediastinum, 14 in the thoracic wall, and 10 in the lung.

Radical Small-Bowel Resection: Report of Two Cases. R. H. Jordan Jr., J. R. Stuart and J. D. Briggs. *Am. J. Digest. Dis.* 3:823-843 (Nov.) 1958 [New York].

Available evidence suggests that resection of 50 to 60% of man's small intestine is compatible with a normal existence; however, the surgeon may have to resect more than that amount. At such times the question arises, What degree of disability may be expected by patients who survive operation? The purpose of this paper is to evaluate by a review of the literature the postoperative status of patients surviving radical resection (75% or more) of the mesenteric small intestine and to report 2 new cases. Forty-four cases reported in the literature fulfilled the criteria for radical small intestine resection and were observed for a minimum of 3 months after operation. To this series the authors add the case of a patient who survived 2½ years in good health with only 35 cm. of small intestine remaining. Evaluation of the postoperative results in these 45 patients revealed that excellent or good results were obtained in all but 10 of the patients, that is, 35 of the patients were not incapacitated. Although the study of these cases did not conclusively indicate the relative importance of the jejunum and the ileum for maintenance of nutrition,

the results appeared best when a portion of the ileum, rather than a segment of the jejunum, remained. Since no patient lived longer than 10 months after duodenocolostomy, it appears that a segment of mesenteric small intestine is essential for life and that the only indication for retaining intestine of questionable viability is the avoidance of total excision of the small intestine. Early operation for necrotic intestine is important, not only to reduce postoperative mortality but also to increase the likelihood of a viable segment of small intestine.

Occasionally the necessity for radical resection of the small intestine and subtotal gastrectomy occurs in the same patient. Since either procedure alone may produce serious nutritional problems, it was not unexpected that both operations on the same patient would yield poor clinical results. The authors found reports of 8 cases with both procedures in the literature, and they add the history of a 9th patient. The results were excellent in 2 patients, who had 4 to 5 ft. of remaining small intestine, good in 1, and poor in 6. It is suggested that the gastrointestinal continuity in patients surviving this combination of operations be restored by a gastroduodenostomy. By this procedure 20 to 40 cm. of intestine, bypassed by other types of anastomoses, is made available for digestion and absorption. The data summarized suggest that the response to radical resection of the small intestine is variable and cannot be closely correlated with the age or sex of the patient and the length of the remaining intestine. Satisfactory results after resections in this category depend in part upon the patient's psychological motivation and in part upon continuous careful management of his diet and health, particularly during periods of stress.

Acute Gastric and Duodenal Ulcers After Thoracic Surgical Interventions. F. Rothhoff, R. M. Konrad and K. H. Willmann. *Arch. klin. Chir.* 290:31-38 (no. 1) 1958 (In German) [Berlin].

At the Surgical Clinic of Düsseldorf, Germany, the authors observed 20 patients in whom acute gastric or duodenal ulcers or erosive hemorrhages developed immediately after operations on thoracic organs, such as the heart, the large vessels, or the lungs. Since formerly the authors had not been in the habit of resorting to roentgenologic examinations when patients complained of discomfort in the abdominal region after thoracic operations, they believe that the aforementioned 20 cases do not include all such cases that occurred at their hospital. In 5 of the 20 patients massive hemorrhages occurred, of which 3 were fatal. In 2 others the hemorrhages were threatening, but they could be arrested by conservative methods. In the remaining patients there existed more or less severe gastrointestinal symptoms, with occult blood in the

stools or roentgenologically demonstrable ulcers of the stomach or duodenum. The ages of the 20 patients ranged from 4 to 65 years.

The signs and symptoms appear suddenly and without premonitory symptoms in the severe forms or after a history of typical disturbances. The duration of the operation, the type or depth of anesthesia, and the age and sex of the patient appear to have no influence on the development of the acute peptic ulcerations. In some patients with threatening hemorrhages, the authors were unable to detect roentgenologic signs of ulcers, whereas in patients who had practically no symptoms they sometimes found definite niche formation on the roentgenograms. Nearly all the patients had a gastritis characterized by hypersecretion. For this reason the authors believe that a hemorrhagic gastritis might have existed in the patients in whom ulcers could not be detected roentgenologically. In autopsy studies they discovered in 2 cases erosive changes in the mucosa of the stomach as well as of the duodenum. The older theories on the pathogenesis of these ulcerations suggested neurogenous processes by way of the hypothalamus and the vagal nerves. Selye showed that so-called stress processes may induce acute gastrointestinal ulcers during the shock phase. More recent investigations, however, demand a humoral component that acts by way of the hypothalamus, the hypophysis, and the adrenals. The authors at present are conducting routine investigations on the acid values of the stomach during thoracic operations carried out with the patients under intratracheal anesthesia. They observed a considerable hypersecretion in all cases but feel that definite conclusions are not as yet justified.

On Portacaval Anastomosis in Patients with Cirrhosis: Case Reports. A. Vannotti. *Helvet. med. acta* 25:298-301 (Oct.) 1958 (In French) [Basel, Switzerland].

The author presents 6 cases observed in the medical clinic of the University of Lausanne, in which the clinical picture of hepatic cirrhosis was accompanied by frequent hemorrhages of the digestive tract, resulting from large esophageal varices, and by the appearance of ascites, distended abdomen, and a strongly developed venous network on the abdominal wall. Portacaval anastomosis considerably improved the clinical picture of these patients, and all of them were able to return to work. The author makes suggestions as to the cause of circulatory disturbances in the veins of cirrhotics. One of them is that there may be a vasodilating substance in the blood which would normally be destroyed but is no longer metabolized by the impaired liver. Besides peripheral vasodilatation due to such a vasodilating substance and to increase in

volume of circulating blood, there is probably in the cirrhotic a vasodilatation due to loss in elasticity of the perivascular structures.

In all the cirrhotic patients who underwent portacaval anastomosis, liver function, as measured by bilirubin and urea levels, by prothrombin, flocculation, and Bromsulphalein tests, and by esterification of cholesterol, remained practically unchanged. Circulatory disorders, though, were favorably influenced by this operation which avoided portal hypertension and its grave consequences—hemorrhage and ascites. Portal hypertension generally provokes splenic stasis and frequently splenomegaly, and, in general, there is no regression of signs of hypersplenism when portal hypertension and splenic stasis have been eliminated by portacaval anastomosis. Splenic reticulosis also causes splenic stasis. It is frequently useful to combine a splenectomy and a portacaval anastomosis in a two-stage operation. Cirrhotics who have large esophageal varices, and especially those who have had serious hematemesis in the past but whose tests show that liver function is still relatively efficient, are good operative risks. The Bromsulphalein test should not reveal more than 25% retention one-half hour after injection; the total level of serum albumin should not be lower than 3.5 Gm. per 100 cc.; the level of serum bilirubin should not be above 1 mg. per 100 cc.; and the prothrombin concentration should not be below 50%.

The great danger present in cirrhosis is gastroesophageal hemorrhage, with its indirect consequences in anemia and hypoproteinemia and its effect on circulatory and hepatic functions. Research at Lausanne on the subject of enzymatic activity of the hepatic parenchyma has shown that 12 different enzymes are active in liver. In hepatic cirrhosis, the activity of a series of enzymes regulating the reduction in carbohydrates and the Krebs cycle is clearly diminished, and oxidative phosphorylation is measurably inhibited. These studies show that apoferment especially is insufficient in hepatic cirrhosis.

Management of Patients with Massive Resection of the Small Intestine with Special Reference to the Use of Steroid Hormones. E. Kogan, A. Schapira, H. Janowitz and D. Adlersberg. *Am. J. Digest. Dis.* 3:844-856 (Nov.) 1958 [New York].

In an earlier communication the authors reported clinical observations on 11 patients who had undergone massive resection of the small intestine. In this paper they discuss difficulties and problems involved in the management of these patients. The chief symptoms after intestinal resection of great magnitude are anorexia, diarrhea, and steatorrhea. Loss of weight may be considerable. Proper diet is one of the cornerstones of therapy and should be high in carbohydrates, preferably monosaccharides,

moderately high in protein, and low in fats. Replacement of deficits in minerals, vitamins, and fluid is difficult. It requires flexibility of approach and careful observation of the symptoms and signs presented by each patient. The results vary with the patient and depend on the magnitude of the resection and complications, such as tetany, hemorrhagic manifestations, and changes in the skeleton.

The results obtained with the use of steroids in the primary malabsorption syndrome (nontropical sprue) prompted their trial in 2 patients who had undergone massive resection of the small intestine and in whom conventional therapy failed. These 2 patients as well as a third, reported elsewhere, are presented to illustrate the problems that occur in the management of this condition. Adrenocortical hormones cause a definite, often dramatic clinical improvement in patients resistant to the accepted forms of therapy. It is suggested that corticotropin (ACTH) or steroids be used when malabsorption appears in the postoperative period after sacrifice of significant areas of small intestine. Later, therapy should be continued with smaller maintenance doses of corticosteroids, preferably prednisone or prednisolone.

NEUROLOGY & PSYCHIATRY

Early and Late Manifestations of Closed Cranio-cerebral Injuries in the Electroencephalogram. F. Pampus. *Chirurg* 29:484-487 (Nov.) 1958 (In German) [Berlin].

While the changes and deviations from the normal in the electroencephalographic curves permit deductions about type, extent, and localization of brain lesions, the diagnostic value of electroencephalographic studies is restricted in several respects. For instance, the leads are taken not from the brain but from the scalp, thereby isolating delicate fluctuations in electrical potential. The media interposed between cerebral cortex and the recording electrodes, such as the subarachnoid fluid, the dura, the bone, the galea, and the skin, produce physical scatter, so that small zones with reduced electrical activity are covered by the rhythms of adjoining regions, whereas circumscribed foci with increased electrical activity are registered encephalographically far beyond their site of origin. Furthermore, the electrical discharges of the cerebral cortex are manifestations of vital functions that are determined not only by cerebral functions but also by disturbances in the circulation and in the oxygen, carbon dioxide, and sugar contents of the blood and by the acid-base equilibrium.

The electroencephalographic changes like the clinical manifestations are influenced by the time at which they are recorded and by the severity of the injury. The author, who was able to make elec-

troencephalographic studies on boxers within a few minutes after relatively mild trauma, found that deviations from normal activity are relatively frequent, but subside within a few hours or days and do not recur. In patients with more severe injuries, the electroencephalographic changes disappear more slowly, or even increase in severity during the first few days, not only in intensity but also in extent. These "secondary" increases must be interpreted as sequels of reactive processes in the damaged region, being caused by vasospastic reactions or by pathological metabolic processes, and may lead to an activation in the cerebral potential and to dysrhythmias that may reach spasmodic potentials. They are frequently followed by a retardation in the basic rhythm. Delta waves of less than 4 per second always indicate cerebral edema. The clinical picture of these patients often indicates an organic brain lesion, by the secondary appearance of neurological focal signs or by serious disturbances in the general condition. Prolonged systemic disturbances are a sequel either of lesions deep in the brain stem or of an inflammatory cortical irritation. This latter condition may be caused by hemorrhage from subarachnoid contusions and the post-traumatic meningeal reaction, or by a progressive infectious meningitis. Massive, progressive focal symptoms suggest an intracranial hemorrhage or an early abscess.

The author also calls attention to observations he made during the secondary post-traumatic phase in boxers. In those with disturbances of consciousness, he observed systemic changes that persisted for the entire period of anterograde amnesia. In one boxer with secondary loss of consciousness that followed a relatively mild punch to the head, the sequels of progressive circulatory damage could be demonstrated microscopically in the form of extensive necroses of the brain stem. There seems to be only a difference in degree between temporary and irreversible manifestations. A secondary circulatory impairment or hypoxia of the brain may transform primary reversible lesions into irreversible tissue changes, that is, into necroses of the ganglionic cells.

These secondary changes may be caused by local factors, such as vasovasal reflexes, cerebral edema, or spasmodic action of the brain. On the other hand, on the basis of brain-stem-induced disturbances in the central regulations, conditions of shock or collapse may lead to an inadequate blood perfusion. Furthermore, by an increase in body temperature or by spasmodic attacks, the metabolic and blood requirements of the brain may become increased, so that the normal blood supply becomes inadequate and tissue gangrene results. The author concludes that a normal electroencephalogram, especially if only one record is taken, cannot rule out an organic brain lesion but that, if electroencephalographic records are made early and re-

peatedly during the first week after the trauma, they will provide valuable supplementary information about the sequels of closed craniocerebral injuries. Although alone electroencephalographic studies are insufficient, they help to clarify clinical and neurological findings that may suggest multiple diagnostic interpretations.

An Approach to the Problem of Homosexuality in the Military Service. L. J. West, W. T. Doidge and R. L. Williams. *Am. J. Psychiat.* 115:392-401 (Nov.) 1958 [Baltimore].

The Armed Forces of the United States do not accept a homosexual, and during the last 5 years governmental policies concerning homosexuality have become much more punitive. Special military regulations have placed more emphasis on the necessity for identifying and disposing of the homosexual person. After citing some of the existing regulations, the authors review their studies on homosexuality at a large Air Force psychiatry clinic during the 4-year period from 1952 to 1956 when 458 military personnel (16% females) were examined for homosexuality. In 75% of these cases no diagnosis was made, and a routine certificate was prepared, indicating that the subject had been found able to distinguish right from wrong and to adhere to the right, able intelligently to cooperate in any proceedings concerning him, and in sufficiently good mental health that a medical discharge was not in order. Of this group some were persons who had confessed a homosexual act or who had been apprehended in such an act. Many were not true homosexuals. A good number had been named as suspects, but there was no real evidence. Retention was urged in 69 cases in which a psychiatric recommendation to this effect might be needed to resolve the issue. A diagnosis of character and behavior disorder was made in nearly 19% of the cases; two-thirds of the acts of this group were immaturity reactions. Many of these individuals were recommended for general discharge, in the belief that their homosexual acts did not indicate a sexual perversion but rather were minor by-products of emotional immaturity.

A representative group of 201 homosexuals have been followed. About 75% received an undesirable discharge, although the psychiatrist had recommended retention of many of these persons. The final dispositions of 25% were as follows: retained in the service, 16.4%; general discharge, 5%; other administrative discharges, 2%; resignations (officers), 1.5%; and medical discharge, 0.5%. The procedures employed by the Air Force in processing each case were time-consuming, requiring from 1 to 15 months or an average of 5 months. During this period the accused was usually on "casual status," in a special barracks with assorted sexual and other offenders awaiting separation from the service. These persons

were assigned to work-details but were almost never permitted to continue their regular duties.

One hundred fifty individuals, including all referrals for homosexuality, were carefully examined by a team of psychologists, a psychiatric social worker, and a psychiatrist. Most of the gross psychopathological conditions were concentrated in the 25% who were exclusively or predominantly homosexual. Their diagnosis usually was severe psychoneurosis or character disorder. They all obtained significantly pathological scores on most of the psychological tests. The remaining 75% (predominantly heterosexual persons) did not deviate significantly from a control group of airmen awaiting separation for various administrative reasons, and deviated only slightly from a group of healthy controls who had no gross adaptational difficulties. Many of the 75% were deemed good candidates for retention in the service; others seemed to deserve no worse than a general discharge, as unsuitable because of immaturity. The suggestions offered by the authors for a new approach to the problem of homosexuality in the military service include (1) modification of punitive official attitudes, (2) elimination of routine extensive investigations, (3) establishment of the primary disorder as the basis for discharge, (4) elimination of the special stigma, (5) utilization of benign investigation procedures, and (6) fulfillment of present potentially liberal retention policies.

Mepacrine Therapy for Children with Petit Mal. R. A. Miller. *Scottish M. J.* 3:441-444 (Nov.) 1958 [Glasgow].

Since literature reports indicated that the administration of quinacrine (mepacrine) benefits patients with petit mal epilepsy but that the condition tends to become worse when treatment is stopped, the administration of a smaller dose over an indefinite period was tried in the hope that patients might not have a relapse when treatment was terminated. Sixteen children, between the ages of 5 and 12 years, were selected for the investigation. All had suffered from petit mal attacks for periods ranging from 4 months to 4 years. All had been given Tridione for at least 2 months, and most had received courses of other anticonvulsive drugs. As soon as quinacrine therapy was started, all previous forms of treatment were terminated. The 16 children treated were given 100 mg. of quinacrine daily from Monday to Friday of each week for 3 to 24 months. After this period, 10 patients still had symptoms sufficiently severe to justify a modification of their treatment, and 9 of these were given meprobamate (Miltown) as well as quinacrine, the dose of Miltown being 200 to 400 mg. each day in addition to 100 mg. of quinacrine 5 days in each week. After 1 or 2 months of this treatment Miltown was replaced by Tridione in 5 of

these 9 children, the dose being 0.3 Gm. given 2 or 3 times a day, depending upon the patient's age and the incidence of the fits. The course of the combined therapy was 3 to 7 months.

In 15 of the 16 children treated, the parents had gained the impression that quinacrine was better than any of the other preparations the patients had received. Six of the children became asymptomatic, and in 9 the symptoms were less marked. When these 9 were given an anticonvulsive drug in addition to quinacrine, they improved still further. Their petit mal attacks were trivial and did not occur more than twice a day. This had not been possible when anticonvulsive drugs were given alone. Treatment with quinacrine resulted in a marked reduction of akinetic attacks in one patient and cessation of psychomotor attacks in another. Tridione, on the other hand, had no appreciable beneficial effect upon either of these patients. The value of Tridione was enhanced in 5 children by giving it together with quinacrine. In a 6th patient Tridione was more effective after a course of quinacrine than before it. Two difficulties were encountered: one was the production of skin pigmentation by quinacrine, and the other was the occurrence of grand mal attacks in 2 patients. In one, the beneficial effect of quinacrine therapy was doubtful, so the drug was withheld. Though the other patient had improved during the administration of quinacrine, the treatment was curtailed. Little is known of the effect of quinacrine on grand mal attacks.

GYNECOLOGY & OBSTETRICS

Intravascular Gas in the Radiological Diagnosis of Foetal Death in Utero. P. Ross, M. J. Australia 2:495-497 (Oct. 11) 1958 [Sydney].

While the diagnosis of fetal death in utero can usually be suggested on clinical grounds, most authorities agree that roentgenologic examination is indicated for confirmation. The demonstration of signs of maceration, particularly in the skull and spine, are generally regarded as significant. This paper emphasizes the importance of detecting gas in the fetal circulatory system, a sign which was first described by Roberts in 1944, and which since 1949 has been reported by a number of other investigators. The author says that altogether 48 cases have been recorded up to the present time. Gas has been shown in the vessels of the head and neck, the heart and lungs, the abdomen, the extremities, and the umbilical cord. However, the most characteristic appearances are the rounded, lobulated shadows made by gas in the heart and the tree-like shadow of gas in the vessels of the liver. The common sites of gas in the dead fetus are the heart and the vessels of the abdomen, and only rarely is gas seen elsewhere when it is not demonstrable in these regions.

The case of a 37-year-old woman is presented. The patient stated that fetal movements had ceased 4 days previously. Roentgenologic examination revealed a single fetus of about 38 weeks. There was no misalignment or overlapping of the skull bones. The upper thoracic spine showed a little accentuation of its curvature. In the lateral film of the abdomen, a large collection of gas was seen within the heart, and the aorta, great vessels of the neck, and upper abdominal vessels were clearly outlined. The diagnosis of fetal death was made, and a dead, macerated female infant was delivered.

From 65 to 75% of fetal deaths in utero will exhibit roentgenologic signs when such examination is first requested. The roentgenologic signs do not appear within the first 48 hours after fetal death. Evidence has now accumulated to suggest that gas in the fetal circulatory system is the most important roentgenologic sign of death in utero. 1. The presence of gas in the fetal circulation is an absolutely certain indication of fetal death. 2. Gas can be unequivocally detected by roentgenologic examination before the onset of labor in at least 80% of the cases in which it is present. 3. Gas occurs about as frequently in cases of fetal death in utero as definite signs of maceration do, that is, each occurs in about 50% of all cases, probably independently of the other. 4. Gas usually appears earlier than the signs of maceration, often about 3 or 4 days after fetal death; the origin of the gas is unknown. It is recommended that a recumbent anteroposterior view and an erect lateral view be taken routinely in all cases of suspected fetal death in utero.

Latent Genital Tuberculosis in Women, Its Early Diagnosis and Treatment. I. Halbrecht. *Tuberkulosearzt* 12:712-716 (Nov.) 1958 (In German) [Stuttgart, Germany].

Whereas formerly tuberculosis of the female genitalia was regarded as a rare disease with a serious prognosis, it is now known to be generally asymptomatic and comparatively frequent. In the last 15 years, and in several countries simultaneously, latent tuberculosis of the female genitalia is being accepted as a new clinical form, the chief complication of which is sterility. Most investigators agree that this genital tuberculosis is in most cases secondary to primary pulmonary tuberculosis. About the time of the menarche, occasionally earlier, or between the ages of 15 and 20 years, the tuberculous infection is carried by the blood to the genitalia. It is not clear, though, why the uterine tubes, and not simultaneously also the endometrium, become first involved. It likewise has not been explained why cervical tuberculosis is rather frequent in some and rare in other countries.

The author and his associates at the women's clinic of the Hasharon Hospital in Petah Tiqua,

Israel, began in 1944 to make cultures of the menstrual blood and of the intermenstrual cervicovaginal excretions in order to detect genital tuberculosis. Curettage and/or these culture methods have been used at the author's clinic in 600 patients, in 113 of whom tuberculosis of the genitalia was either detected or corroborated. In 40 patients cultures of the menstrual blood were the only diagnostic method used, curettage seeming to be contraindicated since these women either had inflammatory tumors of the pelvis or were virgins; the suspected presence of genital tuberculosis was confirmed in 25 of the 40 patients. In 48 cases cultures and curettage gave identical positive results. In the remaining 40 cases cultures yielded positive results, whereas curettage of the endometrium did not reveal tuberculosis; it is assumed that these were isolated forms of tuberculosis. There were also 13 cases in which biopsy revealed tuberculous endometritis, while cultures were negative.

The author believes that a minimum of 6 to 8 consecutive negative cultures are necessary to exclude genital tuberculosis, and in rare cases a positive result was obtained even after 9 or 10 negative cultures. This is the only method that insures an early diagnosis so essential for the efficacy of antibiotic therapy. Triple antibiotic therapy with streptomycin, isoniazid, and aminosalicylic acid produced cure in 80% of the patients without a recurrence over a period of 4 years. Unfortunately cure of genital tuberculosis rarely signifies cure of sterility. Of the 31 pregnancies that resulted after cure, 21 were extrauterine pregnancies, and 5 others terminated in abortion. The author believes that by analogy it is logical to attribute to spontaneously cured latent genital tuberculosis many of the extra-genital pregnancies that are observed in general practice.

PEDIATRICS

The Use of Chromatin Sex Determinations in the Assessment of Fertility and Intersex Infants. J. A. Epstein, D. K. Briggs and H. S. Kupperman. *Fertil. & Steril.* 9:521-532 (Nov.-Dec.) 1958 [New York].

The morphologic distinctions of the various somatic cells assign a person to one or the other chromatin sex, the normal male being referred to as "chromatin negative" and the female as "chromatin positive." The essential difference between chromatin-positive cells and chromatin-negative cells is that in the former there is an extra chromatin mass associated with the nucleus. Sex diagnosis from the oral mucosal smear and skin biopsy is based on the difference in the number of cells showing the extra chromatin mass associated with the nucleus. In the male less than 4% of the cells show this piece of chromatin, whereas in the female more than 20% show it. In the blood smear, a single

chromatin mass ("drumstick") on the polymorphonuclear neutrophils indicates a chromatin-positive person. There is no drumstick in a normal male; the diagnosis of a male or chromatin-negative person depends not on a low number of chromatin masses but on their absolute absence. Since many persons were found, both normal and abnormal, with as few as 1 or 2 drumsticks to every 500 cells, it is quite possible that a blood smear can be taken from one of these persons, 500 cells examined, and no drumsticks found. This might lead to a mistaken diagnosis of genetic male. However, by paying attention to the nonstalked masses of chromatin, to which Davidson and Smith gave the name of "sessile nodules," the authors found that a preliminary examination of 500 cells gives the important clue to sex diagnosis, by revealing either some sessile nodules or some drumsticks in chromatin-positive patients.

The authors report on 4 patients, 2 adults and 2 infants, in whom this technique of chromatin sex determination was used and in whom the chromatin sex studies were of value in guiding clinical management and assessing the reproductive potential. One of the adults was a 34-year-old man with a history of azoospermia of 9 years' duration. Libido was adequate. The patient shaved daily and had normal male distribution of hair. There was moderate bilateral true and false gynecomastia with some hyperpigmentation of the areolas. The penis was normal in size; both testes were unusually small, and the prostate was poorly developed. A diagnosis of gonadal dysgenesis (Klinefelter's syndrome) was made. On the basis of a positive chromatin pattern and the associated findings, further attempts at unraveling the infertility problem in this patient were believed unwarranted. The second adult patient was a 24-year-old woman with primary amenorrhea and absent secondary sex characteristics, in whom a diagnosis of gonadal dysgenesis (Turner's syndrome) had been made. Her chromatin sex pattern was negative. The patient responded to cyclic estrogen and progesterone therapy with development of secondary sex characteristics. The advantage of the chromatin sex determinations in this patient was not only to emphasize the futility of any aspirations for fertility but also to make the physician aware of the need for appropriate substitution therapy in such a patient in order to achieve adequate development of secondary sex characteristics.

Cases of intersex were presented by the 2 infants, aged 3 weeks and 7 months respectively. The finding of a positive chromatin pattern in the 3-week-old infant was of considerable help, along with 17-ketosteroid-excretion studies, in substantiating the diagnosis of pseudohermaphroditism due to adrenal hyperplasia. In the older infant with no significant history other than the indeterminate sex

organs (with a small phallic structure and an empty, poorly developed scrotal sac) noted since birth, the female chromatin sex pattern proved to be of inestimable value in deciding the eventual sexual and social behavior of the infant. In view of the unlikelihood of the patient's ever having a functional phallus or of being a fertile male, it was felt that the positive chromatin pattern, together with the clinical status, directed the management of this child toward assuming a feminine role in society. Once the chromatin sex has been determined, it is possible to tell the parents whether the patient is likely to be fertile in the chosen anatomic sex. Thus, if the female sex has been chosen for an infant, but the chromatin sex study shows that the child is chromatin-negative, it can be stated categorically that the child will be sterile.

A Staphylococcus Type-80 Epidemic in a Maternity Hospital Illustrating Some Special Features. M. C. Timbury, T. S. Wilson, J. G. P. Hutchison and A. D. T. Govan. *Lancet* 2:1081-1084 (Nov. 22) 1958 [London].

The authors report an outbreak of infection due to *Staphylococcus pyogenes* var. *aureus* which occurred among infants in the Royal Maternity Hospital in Glasgow. The exceptionally virulent phage-type 80 of *Staph. pyogenes* var. *aureus* was first isolated on Nov. 19, 1957, from a submandibular abscess in a baby transferred to the sick-nursery from one of the units of the maternity hospital in which the infants normally stayed beside their mothers' beds in the postnatal wards. Thereafter, until the hospital was closed 6 weeks later, on Jan. 4, 1958, the phage-type 80 strain caused 14 of the 18 infections appearing in the sick-nursery. During the epidemic period the incidence of all staphylococcal infections among the infants was 11%; the figure for infection due to type 80 was 8%. The infections were serious in 9 of the 18 infected infants, and all the serious infections were due to type 80. Five of the 9 babies who had serious infections died. A total of 8 deaths were associated with the epidemic.

When the hospital was closed, nasal swabs were taken from 475 members of the medical, nursing, administrative, and domestic staffs; 38% were found to carry *Staph. pyogenes* var. *aureus* in the nose, but only 3 persons (0.6%) harbored the epidemic strain. *Staph. pyogenes* var. *aureus* was isolated from many samples obtained from dust from floors, curtains, screens, blankets, furniture, and equipment, but type 80 was found once only. Thus, the nasal carriage rate of type 80 among the staff and the rate of colonization of the hospital environment were remarkably low. Of 99 babies who were discharged from the hospital when it was closed, infections developed shortly afterward at home in 21 (21%). Only 4 of these infections caused by

staphylococci acquired in the hospital were due to type 80. This was in striking contrast to the distinct predominance of type 80 in infections in the hospital, but was in accord with the type-80 nasal carriage rate found among infants in the hospital. Ten of the 12 strains other than type 80 which were isolated were penicillin-resistant, indicating that they too were probably acquired in the hospital. This finding suggests that, even in the absence of the epidemic strain, hospital-acquired staphylococci would still be giving rise to a considerable amount of infection. Babies known to have carried or to have been infected with type 80 were visited 4 months after discharge from hospital. There was no indication that the epidemic strain tended to persist unduly in the noses of these children.

Follow-up surveys are essential to determine the true extent of staphylococcal infection acquired in maternity hospitals. Serious staphylococcal infection appearing among infants after discharge should be reported to the local health authority and the hospital in which they were born. In attempting to solve the problem of infection in maternity hospitals, one of the first necessary steps is to discover by systematic inquiry into individual outbreaks the full extent of neonatal hospital-acquiring staphylococcal disease as well as the phage-type and the possible source of the infection.

INDUSTRIAL MEDICINE

Industrial Thallium Intoxication. E. M. Richeson. *Indust. Med.* 27:607-619 (Dec.) 1958 [Chicago].

The author reports on 15 men who were employed by an Ohio plant engaged in the separation of industrial diamonds from abrasives. One step in the process depended on differential separation of the diamonds from certain minerals by gravity in varying concentrations of solutions of organic thallium salts. All but 3 of the men had complaints which may have resulted from their exposure to the organic thallium salts for periods up to 7½ years. A diagnosis of thallium intoxication was eventually made in 6. The chief complaints were abdominal pain, fatigue, weight loss, pain in the legs, and nervous irritability. A diagnosis of appendicitis was originally made in 3 of the men, and 2 of them were subjected to surgical treatment. Albuminuria occurred in 3 patients, and hematuria in 1. One patient had abnormal results from the liver function test, and elevated cerebrospinal glucose and protein levels were observed in one patient. The blood pressure of a 22-year-old man was elevated during his hospitalization for an appendectomy but returned to normal within one month. He returned to work with thallium for another 3 years; during the last 8 months his blood pressure remained elevated and after 4 years in another occupation

was still abnormally high. He had, however, a history of having had on a single occasion a slightly elevated blood pressure before his first exposure to thallium.

Thallium intoxication can present diagnostic difficulties, especially if the history does not reveal any contact with the metal. This is true in early cases of chronic poisoning, because subjective symptoms are not necessarily accompanied by clinical signs or positive laboratory findings. There is no adequate information on certain laboratory tests to ascertain which would be the most useful aids in establishing a differential diagnosis. Urinary excretion of thallium is rare in unexposed persons, but no relationship between excretion rate and either exposure or the appearance of symptoms has been established. Two of the patients with thallium intoxication were treated with dimercaprol (BAL); this agent did not effect prompt relief of symptoms in these 2 patients and apparently did not materially alter the urinary excretion rate in the patient from whom such data were available.

Cancer of the Lung and Nose in Nickel Workers. R. Doll. *Brit. J. Indust. Med.* 15:217-223 (Oct.) 1958 [London].

In 1949 the Minister of Pensions and National Insurance of Great Britain classified cancer of the lung and cancer of the nose as industrial diseases when they occurred among certain classes of workers engaged in the refining of nickel. Data were collected from the records of deaths in districts in which workers at a nickel refinery lived. From the ratio of deaths attributed to lung cancer to deaths from causes other than cancer of the lung and nose among the other men resident in the same area, an estimate was made of the number of lung cancer deaths which would be expected to have occurred among men employed in 4 specified occupational groups. During the years 1948-1956, there were 139 deaths from "other causes" among nickel workers and 48 from lung cancer; the expected number of lung cancer deaths among them was 9.9. The excess did not appear to be due to a bias in favor of diagnosing lung cancer among nickel workers, and it is concluded that during 1948-1956 the risk of nickel workers dying of the disease was approximately 5 times "normal."

During 1948-1956, 13 deaths among nickel workers were due to cancer of the nose. An estimate based upon the national mortality data suggested that the expected number of deaths was less than 0.1 and that the nickel workers' risk of dying of the disease was approximately 150 times "normal." Comparison of the data for 1938-1947 with those for 1948-1956 provided no evidence of any substantial change in the annual number of deaths due to these specific diseases. There was, however, an increase in the average age at which death oc-

curred, and no excess in mortality was apparent for those under 50 years of age. It is, therefore, reasonable to believe that the hazard has been largely or completely removed in the last 35 years. The total number of deaths which are now known to have occurred among British nickel workers from cancer of the lung and nose are, respectively, 126 and 62.

THERAPEUTICS

Preliminary Observations on the Treatment of Postirradiation Hematopoietic Depression in Man by the Infusion of Stored Autogenous Bone Marrow. N. B. Kurnick, A. Montano, J. C. Gerdes and B. H. Feder. *Ann. Int. Med.* 49:973-986 (Nov.) 1958 [Lancaster, Pa.].

The authors report on 2 men, aged 36 and 62 years, with carcinoma of the testes and with renal carcinoma associated with pulmonary metastases, in whom irradiation therapy was proposed and whose diagnostic bone marrow aspirates revealed no infiltration. Before the institution of roentgenotherapy, bone marrow was collected from the sternum and iliac crests and preserved by freezing with the aid of the Polge technique. The cells were stored in a dry-ice chest for periods varying from 14 days to 2 months, during which the patients received roentgenotherapy to the entire torso. The stored diluted bone marrow specimens, which revealed about 80% of the cells to be viable, were infused intravenously after the irradiation. Serial bone marrow examinations revealed severely hypoplastic marrow at the end of roentgenotherapy, followed by progressive increase in active centers in both patients on the 3 occasions of marrow infusion after roentgenotherapy, the first patient receiving 2 such infusions. Since on rare occasions spontaneous recovery from hematopoietic depression may occur, it cannot be concluded that the response in the hematological picture in these 2 patients was due to the infusion of the autogenous bone marrow. It can, however, be said with certainty that the infusion of the bone marrow was innocuous and did not interfere with rapid bone marrow recovery, and that it may have been responsible for it.

The storage in a viable state of bone marrow permits reinfusion of autogenous marrow after hematopoietic depression, which has occurred after irradiation therapy in patients who are to undergo extensive roentgenotherapy. No problem of immunological reaction, such as occurs with homologous transplants, is concerned. The method has particular application for patients with potentially curable malignancies requiring extensive, rapid roentgen-ray irradiation. Such patients are often deprived of adequate therapy because of the hematopoietic depression. The authors felt encouraged

to continue the bone marrow infusion method, and in an addendum they report on 2 additional patients who were given infusions of stored autogenous bone marrow. The results showed repopulation of the bone marrow within 2 to 4 weeks. A group of patients who had less severe bone marrow depression were followed without reinfusion of their stored bone marrows. Serial bone marrow aspirates in these patients revealed persistent hypoplasia 2 to 9 months after completion of the irradiation therapy.

Experience with Reserpine (Serpasil) and Perphenazine (Trilafon) in Acute Alcoholic Intoxications and Alcoholic Psychosis. O. Kofman. *Canad. M. A. J.* 79:988-991 (Dec. 15) 1958 [Toronto].

The author reports experiences in the treatment of 163 alcoholic patients in the acute stage who were given reserpine (Serpasil) and 114 others who were treated with perphenazine (Trilafon), an amino derivative of chlorphenothiazine, during 1955-1958 in the Toronto General Hospital. As a control series, the effects of treatment of the reserpine-treated group were compared with a group of 500 patients previously treated under similar circumstances with intravenously administered insulin and dextrose. On admission, the patients in the first group received 2.5 mg. of reserpine intramuscularly. A further 2.5 mg. was given in 1 hour and again routinely in 6 hours if the patient was still restless. Further amounts were used if the patient remained unsettled. After this, the patient was given either 0.25 or 0.50 mg. of reserpine by mouth 4 times each day. None of the patients with delirium tremens treated in this manner retained their hallucinations beyond a 36-hour period; they were usually symptom-free on the second or the third day. The major side-effect of reserpine therapy was a significant drop in blood pressure, which occurred in 26 of the 163 patients.

Fifty-five patients of the second group were given 5 mg. of perphenazine (1 cc. intramuscularly) on admission. This dose was repeated in 1 hour and again in 3 hours. Most patients received 15 to 20 mg. intramuscularly within 4 to 6 hours. This was followed by oral administration in a dose of 4 mg. every 6 hours. The remaining 59 patients were given a higher dose of perphenazine, namely, 10 mg. administered intramuscularly when treatment was instituted; this dose was repeated after one hour, and thereafter 5 mg. was given as necessary. The drug was particularly well tolerated, and no significant side-effects were observed. Perphenazine therapy appears to be more effective and satisfactory than reserpine or any of the other treatments that have been used by the author, including insulin and dextrose. The ease of administration, as well as the relative ease of nursing care, are valuable features. Although some of the patients

remained tremulous after treatment, in general, they tended to improve rather rapidly within 12 to 24 hours, which period could be compared favorably with the experience with insulin and dextrose as well as reserpine.

Reserpine Treatment of Hyperthyroidism: Preliminary Report. A. M. de Andino and F. Ramos-Morales. *Bol. Asoc. méd. Puerto Rico* 50:267-276 (Aug.) 1958 (In English) [Santurce].

Seven women and a man, between the ages of 23 and 44 years, with hyperthyroidism were treated with reserpine as a sole therapeutic agent at the endocrine clinic of San Juan City Hospital. Clinical symptoms had appeared during periods ranging from 2 months to 4 years before hospitalization; they were severe in 4 cases and mild in 3. Three of the patients had been given methimazole (Tapazole) over periods of 2 weeks to 7 months, but this drug had been withdrawn on account of intolerance or because of lack of therapeutic results. On hospitalization, all the patients reported loss of weight which varied between 3 and 15 kg. (7 and 33 lb.). There was an increase in the basal metabolic rate and the 24-hour test of radioiodine (I^{131}) intake. Reserpine was administered by mouth in daily doses of 0.4 to 1.0 mg. in 3 or 4 fractional doses over periods ranging from 3 weeks to 2 years. The drug was well tolerated by all the patients but one who complained about constant nasal congestion, which disappeared on diminution of the dose. In most of the patients the body weight became normal or exceeded the normal figures during the course of treatment. The results were excellent in 5 patients, fair in 2, and poor in 1.

In the 5 patients with excellent results, the symptoms disappeared and the pulse and basal metabolic rate became normal after 2 or 3 months of treatment with reserpine. The 24-hour test of I^{131} intake became normal after 8 to 19 months. The goiter disappeared completely within a period which required from 7 months to 2 years of treatment. One of the patients in this group had a remission of long duration, during which she became pregnant and gave birth to a normal child. This is the first case of pregnancy and delivery at full term during a long remission, brought about by treatment of hyperthyroidism with reserpine, which has been published in the literature. The 2 patients who had a fair response to reserpine therapy were treated for only a short period (20 and 30 days respectively). The patient in whom the response to reserpine was poor had received the drug for a sufficient length of time (185 days), but she had previously failed to respond to Tapazole in daily doses of 40 mg. for 7 months and was considered a therapeutic failure. Hyperthyroidism in this case was eventually controlled by the administration of I^{131} in the therapeutic dose of 4 mc. The satis-

factory results obtained in 7 of these cases seem to justify the use of reserpine in the treatment of hyperthyroidism in a larger number of patients.

Diamidinodiphenylamine Dihydrochloride in the Treatment of a Histoplasmosis Case. V. H. Stapff and J. E. Mockinnon. *An. Fac. med. Montevideo* 43:116-121 (May-Aug.) 1958 (In Spanish) [Montevideo, Uruguay].

A 46-year-old man was hospitalized at the Hospital de Clinicas of the University of Montevideo, complaining of an illness of 3 months' duration. Besides asthenia and a loss in weight of 12 kg. (26 lb.), he exhibited extensive buccal and oropharyngeal ulcerations which caused acute pain when speaking or eating or during deglutition. He complained of moderate fever and chronic bronchitis with occasional cough. Roentgen-ray examination of the chest showed bilateral infiltration of the lungs (though mainly of the left lung) without cavitation. Histological examination of the sputum revealed tubercle bacilli, and inoculation of this sputum into guinea pigs caused tuberculosis. A biopsy of the oropharyngeal ulcerated region and cultures showed *Histoplasma capsulatum*; but inoculation of the biopsy material into guinea pigs did not produce tuberculosis. The intradermal reaction with histoplasmin was weakly positive; the tuberculin skin reaction was positive. A diagnosis of oropharyngeal histoplasmosis and of pulmonary tuberculosis associated with pulmonary histoplasmosis was made.

The treatment consisted of intravenous injections of diamidinodiphenylamine dihydrochloride, in daily doses of 150 to 250 mg. in 2 series of 11 and 10 injections, respectively, with an interval of 22 days between the injection series. The total dose of the drug given was 4.6 Gm. The oropharyngeal ulcerations healed and disappeared within 14 days, the satisfactory results obtained becoming more evident after discontinuation of treatment. An 8-month follow-up of the patient showed that there was no recurrence of the oropharyngeal lesions and that there was no further development of either the mild bilateral tuberculosis or the histoplasmosis lesions in the lungs.

PATHOLOGY

A Retrospective Study of Lung Cancer in Women. W. Haenszel, M. B. Shimkin and N. Mantel. *J. Nat. Cancer Inst.* 21:825-842 (Nov.) 1958 [Washington, D. C.].

Data on smoking habits, complemented by data on age, race, occupation, marital status, and child-bearing history, were obtained from 29 institutions which had conducted interviews of 158 women with pulmonary carcinoma. Epidermoid carcinoma

was present in 42 patients, adenocarcinoma in 56, and undifferentiated carcinoma in 60. A retrospective investigation revealed that smoking was the largest and only statistically significant item associated with pulmonary carcinoma in this series. The highest risks of epidermoid and undifferentiated types of carcinoma appeared among women using more than one package of cigarettes a day as compared with those who never smoked. The risks were higher for occasional smokers and those who had discontinued smoking than for nonsmokers. The scale of relative risks, according to intensity of cigarette use, was greater for those with epidermoid and undifferentiated carcinomas than for those with adenocarcinomas. No clear correlation between adenocarcinoma and smoking appeared to exist in these patients. Inasmuch as coffee use was included as a control item in this study, only a slight effect, or hardly any, of coffee drinking could be attached to the estimation of relative risks for lung carcinoma. There were no marked risk differences between white-collar workers and non-white-collar workers. No significant effects were found for marital status, pregnancy history, or race. The findings of this study revealed that no sex-linked factor peculiar to lung cancer need be postulated to account for the results on nonsmokers.

Gynecomastia: The Origins of Mammary Swelling in the Male: An Analysis of 406 Patients with Breast Hypertrophy, 525 with Testicular Tumors, and 13 with Adrenal Neoplasms. N. Treves. *Cancer* 11:1083-1102 (Nov.-Dec.) 1958 [Philadelphia].

Gynecomastia in the male was observed in 406 patients admitted to the breast service, department of surgery, Memorial Center for Cancer and Allied Diseases, New York, during the 23 years between 1932 and 1955. In addition to the data from this service, the histories of patients from the urologic service of Memorial Center were analyzed for the incidence of gynecomastia, including 525 patients with testicular tumors and 13 with adrenal neoplasms. Reviewing the cases of the 406 patients, the author says that the constant increase in the number of patients with gynecomastia, observable during each successive 5-year period, reflects not an actual increase but rather an increased cancer consciousness. The number of patients analyzed does not reflect the actual incidence of gynecomastia in that many individuals take no notice of unilateral or bilateral swelling of the breasts.

Gynecomastia occurred predominantly during puberty and adolescence, with a second highest incidence during the "male climacteric" years. The lesion was predominantly unilateral except when produced by testicular or adrenal neoplasms; nodes were enlarged in about one-third of the patients. The location of the mass was usually central (the lesion in male breast cancer is usually excentric).

Nipple abnormality was rare. Trauma was recalled by 14% of the patients; 24% of the patients were found to have, or to have had, endocrine disorders, including general endocrine imbalance and pituitary, thyroid, testicular, and prostatic disorders. Breast cancer did not develop in any of the patients in whom there was a previously recorded or a concomitant diffuse breast hypertrophy. Of the 406 patients, 260 were adequately followed. Of the 136 untreated patients, 115 had complete clinical regression (85%). Among the group that was observed clinically, 6 treated patients and 21 untreated showed no change. Of 124 treated patients (surgery, testosterone therapy, or both), 117 showed satisfactory results (94%). The high figures reflect the fact that the untreated patients were those with mild disease or those who were expected to recover spontaneously without treatment.

The study of patients with testicular tumors revealed a 10% incidence of gynecomastia. There was a similar incidence associated with benign testicular abnormalities. When associated with malignant testicular tumors, gynecomastia was usually bilateral and irreversible (regression did not follow orchiectomy). Of the 13 patients with tumors of the adrenal gland, 11 had tumors of the cortex and 2 of the medulla. Gynecomastia did not occur in the 2 patients with tumors of the adrenal medulla, but 6 of the 11 patients with malignant adrenocortical tumors had bilateral gynecomastia.

While endocrine imbalance is considered the dominant etiological factor of gynecomastia, other conditions that may cause gynecomastia are nutritional deficiencies, administration of estrogen or androgen for therapeutic purposes, liver disease, and testicular, adrenal, or hypophyseal tumors. Trauma calls attention to but does not cause gynecomastia. Gynecomastia occurs as a benign lesion that may regress spontaneously.

Of unknown origin, its importance rests primarily upon the fact that it may be associated with other important and serious concomitant medical problems. Any unexplained gynecomastia, especially bilateral, indicates the necessity for thorough and extensive diagnostic studies.

Effects of Antihypertensive Treatment on the Evolution of the Renal Lesions in Malignant Nephrosclerosis. L. J. McCormack, J. E. Béland, R. E. Schneckloth and A. C. Corcoran. *Am. J. Path.* 34:1011-1021 (Nov.-Dec.) 1958 [Ann Arbor, Mich].

Malignant nephrosclerosis is nearly always associated with severe, persistent elevation of resting diastolic arterial pressure and with other symptoms and signs of the syndrome of malignant hypertension. If treatment does not restore arterial pressure to normal levels, the course of the disease is usually marked by rapidly progressing renal failure; this terminates in death of some 80% of patients within

one year of the onset and of virtually all by the end of 5 years. It has been demonstrated that remissions of this syndrome can be brought about by a variety of measures—lumbodorsal sympathectomy, treatment with bacterial pyrogens or tissue extracts, and (during the past 6 years) the administration of one of a variety of potent antihypertensive drugs that have in common the capacity to lower diastolic arterial pressure. There have been reports indicating that the treatment of malignant hypertension with potent antihypertensive drugs greatly alters the evolution of renal vascular lesions in this disease.

The authors studied the lesions in sections procured from kidneys of 100 patients who had had malignant nephrosclerosis and on whom autopsies were performed. Nineteen of these had been under treatment with antipressor drugs. Treated patients, especially those who had been under therapy for long periods of time, almost always exhibited remission and healing of the acute arteriolar lesions—thrombosis, thrombonecrosis, and glomerular necrosis. These patients also showed a noteworthy alteration in the nature of the vascular disease. Large and medium-sized renal arteries revealed subintimal fibroplasia with progression to occlusion in some vessels. It is this lesion which presumably leads to the slowly progressive renal failure which was the cause of death in a majority of the treated patients in the group. The observations substantiate the clinical inference that patients with therapeutically induced remission of malignant hypertension exhibit an increased incidence of arteriosclerosis and its complications. This presumably reflects the damage inflicted upon the arteries during the pre-treatment period of uncontrolled hypertension. The lesions observed in treated patients correspond to those encountered in hypertensive rats receiving a potent antipressor agent.

A Study of Arsenic in Regular-Sized Unfiltered and Filtered Cigarettes. R. H. Holland, R. H. Wilson, A. R. Acevedo and others. *Cancer* 11:1115-1118 (Nov.-Dec.) 1958 [Philadelphia].

The authors point out that it is now generally agreed that arsenic is carcinogenic to man. In 1947 Neubauer reported 143 medicinal and 24 occupational arsenical cancers. In 1956 Hueper was able to compile 23 cases of carcinoma of the lung, recorded during the preceding 75 years, in which arsenic was considered to be the occupational carcinogen. More recently, Roth found 12 lung cancers in autopsies on 27 vineyard workers who had used arsenical sprays. Lull and Wallach reported a lung cancer mortality rate among males of 145.7, 48.6, and 46.3 per 100,000 population, respectively, in 3 copper-mining-and-smelting counties in Montana. The authors also show that the arsenic content of regular-sized, unfiltered American cigarettes has

increased from 7.5 to 30.0 ppm in 1932-1933 to 42.5 to 52.0 ppm in 1957, an increase of 200 to 600%. Two kinds of Turkish cigarettes and one kind of low-nicotine cigarettes contained 8.2, 6.3, and 10.8 ppm of arsenic, respectively, in 1957. This increase in the arsenic content of cigarette tobaccos in the past 25 years is attributable to the use of arsenic insecticides.

Because of the recent trend toward smoking filtered cigarettes, a study of the effectiveness of filters in removing arsenic from the puffed smoke was carried out. Seven leading brands of filtered cigarettes were tested as to the arsenic content of the cigarette and filter prior to smoking and of the filter, butt, and ash after smoking. The distribution of arsenic in smoking the average, regular-sized, unfiltered cigarette that contains 45 mcg. of arsenic as arsenic trioxide is shown in a diagram. After the cigarette is smoked, 14 mcg. of the arsenic is in the butt, 15 mcg. in the ashes, and 16 mcg., or 35.5% of the total, is volatilized in smoke. It has also been estimated that, when two-thirds of an average-sized, unfiltered cigarette is consumed, 4.95 mcg. of arsenic trioxide will be inhaled. A study of the effectiveness of cigarette filters in removing arsenic from the puffed smoke indicates that only 0.5 to 1.9 mcg. of the arsenic in the puffed smoke is removed by the filter. Although the evidence linking the arsenic in cigarette smoke with lung cancer is highly suggestive, it is felt that a sober approach to the problem with clinical and laboratory studies is needed to prove or disprove the hypothesis.

RADIOLOGY

Intravenous Angiocardiographies: An Analysis of 660 Cases. A. Castellanos, O. Garcia and E. Gonzalez. *Acta radiol.* 50:261-272 (Sept.) 1958 (In English) [Stockholm].

Intravenous angiocardiography utilizing a superficial vein of the upper or lower extremity was carried out in 660 patients in Havana, Cuba. Most of the patients were children; 190 were less than 1 year old, and 180 were between the ages of 1 and 2 years. The number of patients decreased sharply in the age group between 11 and 12 years; only 30 patients between the ages of 20 and 30 years underwent intravenous angiocardiography, and none of the patients subjected to this examination was older than 40 years. The volume of the contrast medium injected varied most frequently between 1.1 and 1.5 cc. per kilogram of body weight. Larger doses were administered in selected patients after due consideration of the topography of the vessel through which the injection was to be made, the concentration of the contrast medium, the size of the heart, and the clinical state of the patient. The

left basilic vein was used most frequently. This is explained by the fact that cardiac catheterization preceded the angiocardiography. The 2 jugular veins were used in 180 children; the jugular vein is the vessel of choice in infants, aged less than one year, because of the short distance between the site of the injection and the right cardiac chambers. The injection time was recorded in 538 patients, and in 463 of these the injection was made in one second or less, i.e., within the time generally considered best for obtaining the most satisfactory results. A concentration of 70% contrast medium was used in 647 (98%) of the 660 patients. Sodium acetizoate (Urokon) was employed in 339 patients and iodopyracet (Diodrast) concentrated in 312 patients. A Castellanos no. 10 cannula was used in 6.3% of the patients and a Castellanos no. 12 in 33%.

There were 44 slight, medium, and serious side-reactions, most of which were the result of toxicity of, and hypersensitivity to, the chemicals employed as contrast mediums. Allergic effects characterized by coryza and urticarial rash were observed in 4 patients. Death resulted from angiocardiography in 6 patients, representing a mortality rate of less than 1%. Three of these 6 patients had an extreme degree of tetralogy of Fallot, 1 had a three-chambered heart, 1 had fibroelastosis, and 1 had total transposition of the great vessels with auricular fibrillation. Five of these 6 patients were less than 16 months old, and the one patient with marked auricular fibrillation was 17 years old. Every one of the infants who died was cyanotic. Four rules must be followed in the performance of intravenous angiocardiography: 1. The injection should be made into the veins nearest the heart. 2. The highest possible concentration and the smallest volume of contrast medium should be used. 3. The contrast medium should be injected as rapidly as possible. 4. The largest cannula consistent with the vein chosen for the injection should be employed. Intravenous angiocardiography, as opposed to cardiac catheterization, remains the method of choice for providing correct and complete diagnostic information in pediatric cardiology.

Results of Roentgen Treatment of Acromegaly: A Clinical Review. B. Arner, M. Lindgren and B. Lindqvist. *Acta endocrinol.* 29:575-586 (Dec.) 1958 (In English) [Copenhagen].

The course of acromegaly is unpredictable, for which reason caution must be exercised in the evaluation of the effect of treatment. For many years symptoms of compression of the optic nerve have been, and still are, an indication for operation. However, most neurosurgeons regard patients with acromegaly as poor operative risks because of the danger of hemorrhage in the operative field. It is

possible that the modified transnasal approach, described in 1956, might reduce the risks attending hypophysectomy. It is also possible that ultrahard radiation and the stereotactic technique will make it possible to deliver hitherto unattainable doses to the hypophysis. There is reason to expect that more radical methods will control those symptoms of acromegaly due to hormonal hyperfunction of the hypophysis, but these results can only be achieved at the price of panhypopituitarism. Advances made during the last decade in endocrinology have now provided good substitution therapy.

It was against this background that the authors reviewed in 1954-1955 the records of 20 patients with acromegaly treated during the period from 1922 to 1953 by roentgen-ray irradiation only. Nineteen patients had no symptom of compression of the optic nerves; one patient had a large visual-field defect which was considerably diminished by roentgen-ray treatment. This therapy was accompanied by a certain regression of swelling of the soft tissues in the parts of the body involved; no regression was observed in the acromegalic growth disorders of the skeleton. In none of the cases was it necessary to operate because of optic nerve complications during the later course of the disease. The late prognosis as to life was good in the present material, and there was no excessive morbidity from cardiovascular disease.

BIOCHEMISTRY

The Serum Trihydroxy-Dihydroxy Bile Acid Ratio in Liver and Biliary Tract Disease. J. B. Carey Jr. *J. Clin. Invest.* 37:1494-1503 (Nov.) 1958 [New York].

Serum bile acid determinations (chiefly cholic acid) have been of little value in the study of hepatobiliary disorders. There has been no agreement concerning either the quantity or the nature of the bile acids alleged to be present in normal serum. More recently studies showed that bile acids are demonstrable by paper chromatography in most normal human serums and that these acids are the same as those in bile and occur in approximately the same relative proportions. The author describes a quantitative method for the simultaneous differential determination of serum trihydroxy and dihydroxy bile acids. Normal values were established for healthy subjects. The author found that the serum concentrations of either the trihydroxy or the dihydroxy bile acids were commonly elevated in patients with hepatobiliary disease, and although this information was not especially helpful, it became apparent that the ratio of the 2 main bile acid types often separated the patients into 2 groups. Those with predominantly hepatocellular injury had a trihydroxy-dihydroxy ratio of less than

1, whereas those with obstructive jaundice usually had a ratio of greater than 1. The dihydroxy acids predominated in the serum of patients with Laennec's cirrhosis, whereas patients with obstructive jaundice tended to have higher concentrations of trihydroxy acids.

Bile acid determinations were made on serums of 41 patients in whom the diagnosis of biliary obstruction or parenchymal liver disease was confirmed by laparotomy, biopsy, peritoneoscopy, or autopsy, and all of these are included in this report. It was found that with severe liver injury a disproportionate increase in the dihydroxy bile acid concentration reduced the trihydroxy-dihydroxy ratio to less than 1. Persistence of this reversed ratio is frequently followed by coma, death, or both. When the ratio is only temporarily reversed, as with acute or transient liver injury, improvement or recovery of the patient is paralleled by a rise in the ratio toward a value of 1 or more. This is helpful in estimating the extent of liver injury and monitoring its course. With biliary obstruction, whether intrahepatic or extrahepatic, the serum bile acid concentrations are increased, but the ratio remains greater than 1.

The Oxytalan Fiber: A Previously Undescribed Connective Tissue Fiber. H. M. Fullmer and R. D. Lillie. *J. Histochem.* 6:425-430 (Nov.) 1958 [Baltimore].

Analysis of complete autopsies performed on rats, mice, and guinea pigs and analysis of selected human tissues obtained from autopsy and surgical specimens revealed a separate connective tissue fiber, distinct from the collagenous, elastic, and reticular varieties, for which the authors coined the term "oxytalan fiber." Oxytalan fibers were found only in the periodontal membranes, tendons, ligaments, adventitia of blood vessels, connective tissue sheaths surrounding skin appendages, and epineurium and perineurium. They were not found in other connective tissues, such as normal and aging dermis generally, granulation tissue, and parenchymatous organ stroma. Their distribution appeared to be restricted to sites where connective tissues are subjected to stress.

Staining tests showed that, after peracetic acid oxidation, the oxytalan fibers stain with aldehyde fuchsin, orcein, and resorcin fuchsin; they fail to react with orcinol-new fuchsin and Verhoeff's stain for elastic tissue. The stainable material in oxytalan fibers is slowly removed by lysozyme, and by testicular hyaluronidase after peracetic acid oxidation, and is believed to be a mucopolysaccharide. There is no observable effect on elastic fibers similarly treated. Elastase does not digest Formalin-fixed oxytalan fibers except after peracetic acid oxidation. A protease contaminant in elastase was noted.

BOOK REVIEWS

Injuries and Surgical Diseases of the Ischium. By Henry Milch, M.D., Attending Orthopedic Surgeon, Hospital for Joint Diseases, New York. Cloth. \$10.50. Pp. 163, with 106 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1958.

This monograph covers all phases of disabilities of the ischium, but is difficult to read and requires great concentration. The anatomy of the ischium and its evolutionary development makes interesting reading. The line drawings, however, particularly those of muscle origin and insertion, are difficult to follow. For the orientation of the reader it would have been much better had this been shown in color. The roentgenographic reproductions throughout the book are not good; mostly they are too dark, and it has been necessary for the author to use arrows to point out what is being described in the text. As a reference book on all disabilities of the ischium this is a worthwhile work but not a ready reference book for the medical student or house staff. It is appreciated that the author has brought into one volume all of the facts about the ischium, and he should be commended for the effort and interest that he has taken in writing the book.

System of Ophthalmology. Edited by Sir Stewart Duke-Elder, G.C.F.O., M.A., LL.D. [To be in 15 volumes.] Volume I: *The Eye in Evolution.* By Sir Stewart Duke-Elder. Cloth. \$27.50. Pp. 843, with 1,267 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3; Henry Kimpton (medical book department of Hirschfeld Brothers, Ltd.), 134 Great Portland St., London, W. 1, England, 1958.

This is a wondrous, factual, epic story of the development and evolution of the eye from the effect of light on the undifferentiated protoplasm of the ameba to the highly efficient visual sense of the birds. The importance of pigment as an essential feature of photoreceptors is interestingly presented. The description of the different functional characteristics of the visual apparatus of all phyla of the animal kingdom is fascinating. The necessary and multitudinous expedients adopted by an organ of sight to meet the requirements of environments as completely different as the darkness of the ocean and the pure light of the upper air, and habits so diverse as the quasi-immobility of a parasite and the constant activity of a bird of prey, are beautifully related. The author constantly compares the attributes and inefficiencies of one species of animal with those of another. The exigencies of nocturnal and diurnal vision are met by variations in the size, shape, and motility of the pupil and by the provi-

sion of a tapetum, choroidal or retinal, augmenting the amount of light by its mirror-like effect. Visual acuity is provided by the area centralis or fovea; stereopsis through a swing forward of the visual axes, the location, shape, and movement of the lens proper in certain fishes, and the development of accessory retinas in certain fishes.

The unusual variation in color of the irises of birds meets the specific needs and functions of each species. The development of the proficient sight of the owl, which, even though its eye is especially adapted for nocturnal vision, will detect a hawk approaching in the daylight sky at a height at which it is invisible to man even though its wing spread might be 15 ft., is truly remarkable. The chapter on bioluminescence is one of the most captivating in the book. The author presents interesting information about and spectacular photographs of luminous and electric organs of fish. This is the first time that this subject matter, which forms the very basis of the development and science of sight, has been gathered together in a single book. The numerous marginal sketches are a welcome addition. The zoological glossary is a novel feature. Any student of science, biology, or ophthalmology who has had the privilege of reading any of the author's works before should be looking forward to the other volumes of this series.

Applied Medical Library Practice. By Thomas E. Keys, A.B., M.A., Librarian, Mayo Clinic, Rochester, Minn. With chapters by Catherine Kennedy, B.S., L.S., Associate Librarian, Mayo Clinic, and Ruth M. Tevs, B.S., L.S., Hospital Librarian, Mayo Clinic. Cloth. \$10.75. Pp. 495, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

In this welcome addition to the files of library literature, the author states that the book is designed to teach the physician how to use a medical library for research. To this end he describes what is in a library, how it is arranged, how to use the indexes and guides to its contents, and how to locate the desired materials. This coverage includes such fields as the administration of the library and the cataloging of its contents. A useful chapter on medical indexes describes, compares, and evaluates the various indexes and tells how to use them to compile a bibliography. A later chapter teaches how the bibliography itself should be prepared. There is a good discussion of abstract journals and how to use them and a chapter on how to collect and arrange a reprint collection. Research libraries and private medical libraries are described. One

chapter lists 78 representative medical libraries in the United States, describing the purpose, scope, size, and loan policies of each. This is useful for physicians who have no library facilities at hand. Some valuable and interesting facts on the history of medical books and medical publishing provide useful reference data. A final chapter on changing concepts in library service gives the reader a look into the future. There are valuable lists of publishers and dealers in the appendix. The style is extremely readable. References follow each chapter. The print is good, and the index is comprehensive. This volume furnishes, for the physician using a medical library, the same type of information and assistance that the Medical Library Association's handbook of medical library practice offers for the librarian, but the information itself is not the same. It has a definite place on the bookshelf of any doctor, student, or librarian who has occasion to use the research facilities of a medical library.

The Extra Pharmacopoeia, Martindale, Incorporating Squire's Companion. Volume I. Published by direction of Council of Pharmaceutical Society of Great Britain. Twenty-fourth edition. Cloth. 65 shillings. Pharmaceutical Press, 17 Bloomsbury Sq., London, W. C. 1, England; [Rittenhouse Book Store, 1706 Rittenhouse Sq., Philadelphia 3] 1958.

The Extra Pharmacopoeia, originally produced by William Martindale in 1883 and now published by the Pharmaceutical Society of Great Britain, contains information on the drugs presently used in Great Britain. This edition has been entirely revised, reset, and increased in size because of the addition both of new drugs and of new material on drugs already described in previous editions. Although this edition appears only six years after the 23rd edition, it was necessary to increase the size by almost 350 pages. The general section contains about 1,400 pages of drug descriptions listed in alphabetical order under English titles. It was found to be convenient, however, to group certain classes of drugs such as the sulfonamides, the barbiturates, and a few others. Included under the specific drugs are a dosage statement, a brief physical description of the compound including solubilities, toxic effects, and incompatibilities, antidotes, contraindications, uses, sizes available, and proprietary preparations containing the drug. Many of these monographs contain brief abstracts of pertinent literature and references to original articles. Also included in this section are supplementary lists of drugs, with proprietary preparations containing them, that are of interest but are not as widely used as those in the general list.

The book also contains special sections on antibiotics, immunological agents, and radioactive isotopes. The antibiotic section, in addition to including the usual material on drugs, contains a discussion of the use of antibiotics in specific diseases and a chart on antibiotics selection. The volume includes

a useful therapeutic and general index. Although the book lists drugs used chiefly in Great Britain, and is based mainly on the British Pharmacopoeia and the British Pharmaceutical Codex, pharmacopoeias of many other countries were also consulted and used. The book deserves wide use in the United States.

An Atlas of Esophageal Motility in Health and Disease. By Charles F. Code, M.D., Ph.D., Professor of Physiology, Mayo Foundation, Rochester, Minn., and others. Cloth. \$8.50. Pp. 134, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This atlas is a record of motility studies of the normal and diseased esophagus. The technique of obtaining esophageal pressures at various levels is described and the instruments used are excellently illustrated. Tracings obtained at various levels during resting phases and deglutition are shown, with brief explanations directly under the tracings or on the facing page. Various representative curves are enlarged and the significant information they reveal is described and explained. The remainder of the book is clear and concise, including tracings of intraesophageal pressures in such conditions as achalasia, diffuse esophageal spasm, and scleroderma. Interesting phenomena of response to stimuli obtained from medication are also illustrated. This book should be of interest to clinicians and physiologists who deal with the problems of the gastrointestinal tract. It is admittedly limited in scope, although from the title one would expect a more comprehensive analysis of esophageal motility. The motility in such conditions as caustic strictures, neoplasms, and diverticula is not shown.

Patients, Physicians and Illness: Sourcebook in Behavioral Science and Medicine. Edited by E. Gartly Jaco, Associate Professor of Medical Sociology, University of Texas Medical Branch, Galveston. Cloth. \$7.50. Pp. 600. Free Press, Glencoe, Ill., 1958.

This volume is put forth as a source book, an effort to present in compact fashion the ideas of various representatives of the behavioral sciences on different aspects of the art and science of medicine. It attempts to bridge the gap between two disciplines which, though still widely separated, have taken some steps toward *rapprochement*. These steps have been made necessary by the changes in the concepts of disease and in the practice of medicine. Recognition of the place of the behavioral sciences in medicine has been slow to come about; but gradually behavioral scientists are being introduced into medical school faculties and hospital staffs, and attention is being given to courses in human behavior and to the impact of cultural and social factors beyond the scope of the biological sciences on human life.

The 55 short chapters in this book are written by 63 contributors. Many of the chapters should be of interest to the physician and all of them to the medical educator and administrator, for they mark significantly the changing practice which seems to be in the offing as the population increases and as functional and geriatric ills occupy more of our attention. Also, the change in the locus of medical practice from the home to the physician's office and the hospital has led to changes in that essential factor in all treatment, the physician-patient relationship. With the rise of specialization, the patient loses that close relationship he once had with the family physician and becomes fragmented and divided among various specialists. The more fragmented he becomes, the more fragmentary is his relationship with the physician, and this change is becoming more marked each year. Though we may not like some of these changes it is wise for us to know about them, and this book serves a useful function by showing how modern medical practice looks to trained objective observers.

Regional Ileitis. By Burrill B. Crohn, M.D., and Harry Yarnis, M.D. With special contributions by Richard H. Marshak, M.D., and David A. Turner, Ph.D. Second edition. Cloth. \$7.25. Pp. 239, with 81 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

The author of this monograph is the originator of the concept of regional ileitis as a disease entity. The book covers both regional ileitis and a group of allied granulomatous diseases occurring in other portions of the intestine. The literature to date is surveyed and the author also presents his own extensive experience in treating over 500 patients with ileitis and an additional 100 with inflammatory disease in other segments. There are valuable data on the natural history of the disease and the expectation of treatment by medical and surgical means. Radiographic diagnosis and malabsorption are covered in separate chapters by additional authors. In spite of feeble editing, the book is a valuable reference work for gastroenterologists, surgeons, radiologists, and others who have an interest in this puzzling disease.

Young Endeavour: Contributions to Science by Medical Students of the Past Four Centuries. By William Carleton Gibson, D.Phil., M.D., C.M., Kinsmen Professor of Neurological Research, University of British Columbia, Vancouver. With foreword by Sir Henry Dale, O.M. Cloth. \$6.50. Pp. 292, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

"We must," says the author of this book, "encourage enquiring minds in medicine." In 12 chapters filled with lively details he tells the stories of the many men in the history of medicine who either made outstanding discoveries in their student days

or clearly laid the foundations when they were young for later discoveries. In the last chapter he discusses the old questions of how to prevent the academic atmosphere from becoming stagnant with orthodoxy and conformity, how to create conditions favorable to discovery, what it is that produces a scientific bent in some people even in childhood, and how one man could accomplish what he did while "living on radishes and bread and the charity of a hospital for incurables in Italy" while another subsisted on "eggs and milk and the charity of a pioneer hospital in Ohio." Committees on admission to modern medical schools should find food for thought in the account of one young scapegrace whose mother, named Temperance, sent him off to college "with a Dutch liquor case containing six large bottles filled with various kinds of strong waters . . . enough to craze a whole class of young bacchanalians." Was this a help or a hindrance to his subsequent magnificent career? This book deserves to be widely read, for it should fascinate and inspire anyone who picks it up.

Pediatric Methods and Standards. Editor: Fred H. Harvie, M.D., Associate Professor of Clinical Pediatrics, Department of Pediatrics, School of Medicine, University of Pennsylvania, Philadelphia. Third edition. Paper. \$4.50. Pp. 324, with illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1958.

This small compendium can be easily carried in a physician's bag or in his pocket. It can be used as a quick source of information in pediatrics for the general practitioner. As the author rightfully states, the text is not intended to be all-inclusive nor to contain controversial subjects. For such a small volume it contains a tremendous amount of information. Laboratory procedures are described and this makes a useful addition to the book.

Poisoning: A Guide to Clinical Diagnosis and Treatment. By W. F. von Oettingen, M.D., Ph.D. Second edition. Cloth. \$12.50. Pp. 627. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This second edition of a well-known book deals with the practical aspects of the diagnosis and treatment of poisoning. The author has retained the original format but added a valuable discussion of the potentially dangerous side-effects of therapeutic agents. The material is organized under four main sections. Part 1 contains chapters on the classification and diagnosis of poisoning, medicolegal responsibilities, emergency measures, and equipment. Part 2 describes pathological changes of organs and their functions that may be observed in a medical examination. Signs and symptoms, classified by body systems, are followed by an enumeration of chemicals and drugs which have been reported to cause such effects, biochemical and biophysical changes in the blood and urine and agents which might cause them, and laboratory tests for the

detection of toxic substances in the blood and urine. Part 3 is concerned with the rationale of treatment, techniques for aiding the removal or elimination of the toxic agent, detoxification, symptomatic treatment, and general measures for the treatment of aftereffects. Part 4 provides short descriptions of 575 poisons arranged alphabetically. A synopsis of clinical findings and instructions for treatment are given under each poison along with references for more detailed study. This book is highly recommended for the practitioner and should be available as a standard reference at poison-control centers.

Cardiovascular Sound in Health and Disease. By Victor A. McKusick, M.D., Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore. Comprehensive treatise, introduced by historical survey, illustrated mainly by sound spectrograms (spectral phonocardiograms) and supplemented by extensive bibliography, with section on respiratory sound. Cloth. \$15. Pp. 570, with 494 illustrations. Williams & Wilkins Company, 428 E. Preston St., Baltimore 2, 1958.

The author of this monumental work has gone into great detail in describing how the cardiac sounds and murmurs are produced and how they can best be recorded. There is an excellent chapter on the stethoscope and the art and practice of cardiac auscultation. Phonocardiography is fully described, taking into account the advantages and limitations of various methods used. The recording method used by the author is known as spectral phonocardiography, an application of the method of sound spectrography developed at the Bell Telephone Laboratories. The sound recording is usually first made on magnetic tape. Then a segment of sound is selected for analysis and played over on the edge of a magnetic disk. This permits repeated playback. Visual records of the sound can be made at different frequency bands for analysis. Records of heart sounds and murmurs have become increasingly important in recent years as part of the determination of a patient's suitability for cardiac operations and also in evaluating the results of such operations. Variations in heart sounds and murmurs in a number of cardiac conditions are fully described, accompanied by many illustrations, mostly from the author's files. This excellent source book should be especially valuable for the cardiologist and should be useful also to the general internist.

Modern Trends in Anesthesia. Edited by Frankis T. Evans, M.B., B.S., F.F.A.R.C.S., and T. Cecil Gray, M.D., F.F.A.R.C.S. Cloth. \$15. Pp. 318; 13, with 30 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16; Butterworth & Co. (Canada), Ltd., 1367 Danforth Ave., Toronto 6, Canada, 1958.

This publication is unlike most textbooks on anesthesiology. It should be classified not as a textbook but rather as a series of monographs, contributed by 22 authors one of whom is the senior editor of

the book. This is definitely not a book from which to teach the fundamentals of anesthesia or techniques for its application; it is rather a collection of scholarly essays on the most important phases or trends in anesthesia as presently practiced. The authors did not select anesthetists exclusively as contributors. They have, for example, enlisted the aid of a psychiatrist to present an essay on hypnosis, a surgeon on cardiorespiratory pumps, and a pharmacologist and a physiologist for other appropriate chapters. Except in the chapter on pumps there are few illustrations. These essays cover such subjects as drugs, pulmonary and circulatory physiology, hypothermia, anoxia, fatalities, and research. Since the authors are mostly from England there are occasional statements that are not applicable in the United States, for instance, that cyclopropane is not being used as often as formerly in England. In the United States its use has increased steadily since the war. This book is a delight to read and should be appreciated by specialists in this field, and particularly by teachers. It is written not for the medical student or the beginner but for the specialist by specialists. It is well printed with easily readable type. References are found at the end of each chapter and there is a good index.

A Text-book of X-Ray Diagnosis. Volume III. By British authors. In four volumes. Edited by S. Cochrane Shanks, C.B.E., M.D., F.R.C.P., Director, X-Ray Diagnostic Department, University College Hospital, London, and Peter Kerley, C.V.O., C.B.E., M.D., Director, X-Ray Department, Westminster Hospital, London. Third edition. Cloth. \$23. Pp. 883, with 802 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

In this new edition the subject matter has been revised in keeping with advances made in diagnostic roentgenology since the last edition in 1950. A total of 53 pages and 108 illustrations have been added to the new volume. It is divided into six parts: the alimentary tract; the biliary tract; the liver, spleen, and adrenals; radiology in obstetrics; gynecologic radiology; and the urinary tract. Each section is well illustrated, with the reproductions in the positive phase. The subject matter is presented in a concise manner that is easy to read and includes much useful data on incidence, etiology, pathology, clinical features, and, where indicated, technical aspects. This highly respected text has long since become a classic for English-speaking physicians, representing one of the most comprehensive and informative works covering the entire area of roentgenographic diagnosis. This third edition should earn the same success enjoyed by the previous printings. It is highly recommended not only to the graduate student in radiology but to his preceptor as an essential addition to his library. Any physician interested in diseases within the abdomen should find this work a storehouse of information.

QUESTIONS AND ANSWERS

MUCOVISCIDOSIS

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George C. Mosch, M.D., Coudersport, Pa.

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TO THE EDITOR:—Six years ago a woman lost an only child, a daughter about 3 years of age. The cause of death (no autopsy was performed) was said to be cystic fibrosis of lungs and pancreas. Since that time she had no more children because, as she has been told frequently, the chances are that any further children would also be so afflicted. Is this true? If so, what are the odds that she will have a normal child?

Willard J. Lloyd, M.D., New Hartford, N. Y.

ANSWER.—Fibrocystic disease of the pancreas with accompanying fibrosis of the lungs is inherited. Most studies indicate it is a Mendelian recessive character. Many investigators suggest that about one child in four will be affected. This consultant would be inclined to urge the patient to have another child as soon as possible. Early detection and treatment could have an effect on the progress of the disease if the next child should be affected.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

MENOPAUSE AND CONCEPTION

TO THE EDITOR:—Patients in the menopause often ask how long after cessation of the menstrual period conception is possible. Please give an opinion, with reference to women 47 to 52 years of age and not to those who stop menstruating at the end of the fourth decade. The literature contains contradictory reports on this subject. Are examinations of smears of the vaginal epithelium of any value?

Ludwig Gruenewald, M.D., Sheboygan, Wis.

ANSWER.—Pregnancy in women over 47 years of age is rare, even in those who continue to menstruate beyond this age. In 65,000 deliveries at the Johns Hopkins Hospital, there was only one such case; this occurred in a feeble-minded nonwhite woman who stated she was 49 but may not have known her correct age (Eastman, Williams Obstetrics, ed. 11, New York, Appleton-Century-Crofts, Inc., 1956, p. 218). At the Boston Lying-in Hospital, the oldest known patient to be delivered was 49 (Newell and Rock, *Am. J. Obst. Gynec.* 63:875, 1952). At the Chicago Lying-in Hospital, in over 50,000 deliveries there were two women of 46 and two of 48 years of age who gave birth (Davis and Seski, *Surg. Gynec. & Obst.* 87:145, 1948). DeLee and Greenhill each delivered a woman 52 years of age (Greenhill, *Obstetrics*, ed. 11, Philadelphia, W. B. Saunders Company, 1955, p. 102). In the review by Newell and Rock of the literature concerning the upper age limit of parturition, it was concluded, "From what we have been able to gather from vital statistics and from medical literature, it appears that parturition in a woman over 52 years of age has not been proved and that, therefore, were it surely to occur in a woman, say of 55, it must be considered a gross aberration of reproduction physiology." Waldeyer (*Zentralbl. f. Gynäk.* 58:2882, 1934) reported seven proved cases of reactivation of senile ovaries in women. In these patients, follicles developed in the ovaries to the stage of early corpus luteum formation but not to the stage of full bloom. The endometrium developed only to the interval stage. Hence, even though there was reactivation of ovarian function, pregnancy most likely could not have taken place. In view of the foregoing data, women who stop menstruating after 47 years of age, and certainly those beyond 49, may be told that the chances of a pregnancy are too remote for concern. Vaginal smears will not help to determine the possibility of pregnancy in women past the menopause.

Classification of Patients with Diseases of the Heart*

Functional Capacity	Therapeutic Classification
Class 1 Patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or anginal pain.	Class A Patients with cardiac disease whose ordinary physical activity need not be restricted.
Class 2 Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea, or anginal pain.	Class B Patients with cardiac disease whose ordinary physical activity need not be restricted, but who should be advised against severe or competitive physical efforts.
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Class 4 Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of cardiac anginal syndrome are present even at rest. If any physical activity is undertaken, discomfort is increased.	Class D Patients with cardiac disease whose ordinary physical activity should be markedly restricted.
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No Heart Disease: Predisposing Etiological Factor†

These are patients in whom no cardiac disease is discovered but whose course should be followed by periodic examinations because of the presence or history of an etiological factor that might cause heart disease. It is essential that the etiological diagnosis also be stated.

Undiagnosed Manifestation‡

These are patients with symptoms or signs referable to the heart but in whom a diagnosis of cardiac disease is uncertain. Re-examination after a suitable interval will usually help to establish a definite diagnosis. When there is a reasonable probability that the signs or symptoms are not of cardiac origin, this title should not be used and the diagnosis then should be "no heart disease."

* Classification of the American Heart Association, 1953 revision.

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TO THE EDITOR:—Does depth perception depend on binocular vision? If so, how is it possible for one who has lost all sight in one eye to pass satisfactorily the usually prescribed technical tests used in estimating depth perception? Please give an opinion on the safety of approving the employment of a man with one eye as a crane operator; this person has 20/20 vision in the remaining eye and normal depth perception.

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HYPOTHYROIDISM AND CHRONIC LYMPHOMATOUS THYROIDITIS

TO THE EDITOR:—What effect does hypothyroidism have on chronic lymphomatous thyroiditis (struma lymphomatosa, Hashimoto's disease) and on symptoms suggestive of hypoparathyroidism? A patient with 75% of her thyroid removed has a basal metabolic rate of -27% .

W. J. Tucker, M.D., Ashland, Wis.

ANSWER.—Hypothyroidism is not known definitely to affect the basic disease mechanism or course of chronic lymphomatous thyroiditis. Theoretically, however, the increase in pituitary thyrotropin, which results as the thyroid hormone output decreases, may accelerate the progress of the disease and result in an increase in the size of the gland. This is suggested by the dramatic decrease in size which may follow replacement therapy with thyroid, presumably due to suppression of the thyrotropin output. Minor surgical interference with the gland in a patient with chronic thyroiditis may precipitate the early onset of hypothyroidism with its typical symptoms. Hypothyroidism and hypoparathyroidism may coexist, with typical symptoms of each. There is usually minimal, if any, modification of the symptoms due to the hypoparathyroidism, and both disorders should be recognized and treated by proper replacement therapy.

SCIATICA

TO THE EDITOR:—A patient has had sciatica for five weeks, and no therapeutic agent has given any appreciable benefit, including five or six ampuls of animal gastric mucosa enzyme given parenterally and corticosteroids. The patient is now taking sodium salicylate, and this gives some relief. At night the pain is worse; in fact, during the day the patient has little pain and is active in his work. Aspirin and pentobarbital are taken and a hot pad used for relief at night. If pain occurs in the daytime, infrared rays and an ointment with methyl salicylate are used. Several months ago, the patient fell and struck his occiput. He was unconscious for a few moments and probably sustained a slight concussion. Could this fall have any connection with the present ailment?

R. C. Ferguson, M.D., Eastland, Texas.

ANSWER.—Before attempting to prescribe for relief of what is apparently a severe pain, one would have to have information concerning the motor, reflex, and sensory status of the extremity involved. If any abnormalities are found in the basic neurological tests, x-rays of the lumbosacral area and a spinal fluid examination are indicated. If these findings show any deviation from the normal, an oil myelogram should be made. The term "sciatica" is too vague to warrant symptomatic therapy. One

must exclude a sciatic neuritis, discogenic sciatic neuralgia, and metastatic neoplasm, to mention a few possibilities.

IDIOPATHIC SEIZURE

TO THE EDITOR:—A normal appearing, slightly over-nourished man, aged 30, had without warning or apparent cause a sudden loss of consciousness with falling. This was followed immediately by a convulsive seizure lasting a few minutes, during which time he bit his tongue. There was no incontinence. After one hour of bed rest, he slowly regained consciousness; he was described as being mentally lethargic and dull. The seizure occurred just prior to the lunch period. Findings on physical examination and personal and family history were entirely negative. Blood chemistry and electroencephalographic examinations have not been done. Hypoglycemia was suggested as probably being causative, since the seizure occurred as the man was walking to his noon lunch. He stated that he had felt well all morning but was hungry because he had omitted his customary candy bar and "pop" at the forenoon coffee break; furthermore, he was emotionally upset. Could this episode be reasonably explained on the basis of hypoglycemia?

M.D., California.

ANSWER.—Sudden convulsions occurring in otherwise normal persons, such as this patient, are common. There are 1,500,000 epileptics in the United States, and undoubtedly there are many others who have seizures due to various causes. It is doubtful that hypoglycemia is a factor in true epilepsy. This group has an amazingly stable carbohydrate metabolism. It is difficult to produce an altered curve either on glucose or on insulin tolerance tests. In an experiment by Pollock and Boshes (*Arch. Int. Med.* 59:1000, 1937), the blood sugar levels of known epileptics who had not had any medication for weeks was lowered almost to 0 and many of them were in the range of 20 mg.%. Not 1 of 97 patients had a convulsion. It is much more likely that this man had an epileptic seizure due to some disturbance in the central nervous system. If this was his first seizure, at the age of 30, one should seek an organic cause, such as brain tumor, residuals of previous brain trauma, infection (encephalitis of viral origin or central nervous system syphilis), alterations of cerebral blood flow associated with various degrees of cortical atrophy, and chronic alcoholism. The examination should include careful physical and neurological examinations, electroencephalographic review, roentgenogram of the skull, spinal fluid studies, air studies and angiography of the brain, and blood chemistry, including blood urea nitrogen and serologic tests. It may be necessary to take more than one electroencephalogram, because the patient may be examined in an

interseizure state when the initial tracing may be normal. The following exceptions to such a survey are worthy of note: People who have diabetes mellitus, an islet tumor of the pancreas; or serious hepatic dysfunction from hepatitis or multiple metastases to the liver may show poor carbohydrate metabolism. This type of patient could conceivably have an epileptic seizure associated with a lowered blood sugar level, but, in the case under question, the patient's history was negative.

KIDNEY STONES

TO THE EDITOR:—*The impression has been held that in patients suffering from acute or chronic renal lithiasis the chemical composition of the stone can be determined accurately by microscopic examination of the urine; that is, oxalate crystals in the urine indicate an oxalate stone, and uric acid crystals indicate uric acid stone. Is this generally true?*

Saul H. Kaplan, M.D., Miami Beach, Fla.

ANSWER.—In general, it has not been the experience of most urologists that an accurate determination of the composition of a kidney stone can be made by microscopic examination of the urine. Many oxalate stones are seen without oxalate crystals in the urine continuously. The same thing holds for uric acid stones. Most kidney stones are phosphatic in nature.

POST-TRAUMATIC PTOSIS

TO THE EDITOR:—*A 60-year-old man was hit by the horns of a cow on the left suborbital area, and escaped with only slight injury of the soft tissues, but almost immediately he suffered from a complete ptosis of his left upper eyelid. There was no fracture, no headache, no pain in the eye, and no involvement of the mobility of the eyeball. Visual acuity, visual field, optic nerve head, and retinal vessels were normal. A neostigmine test showed negative results. It is known that isolated muscles innervated by the oculomotor nerve may be paralyzed either from brain stem involvement (since there are specific localizations within the oculomotor nucleus) or from involvement of the nerve itself. In this patient how can the isolated ptosis be explained?*

George C. Mavrantonis, M.D., Nicosia, Cyprus.

ANSWER.—Traumatic ptosis is a frequent sequel to a concussion of the orbital rim and may be due to damage of the levator tendon or injury to the palpebral branch of the oculomotor nerve. A force impinging in this area dissipates in the facial mass and the globe, orbital contents, and brain escape direct concussive injury, but the thin orbital roof usually gives way in the region of the superior orbital fissure. Such a fracture may occur without involvement of the superciliary arch. The causal

injury may be so trivial that the patient is only momentarily dazed. Roentgenograms are of little help because of obscuration by denser surroundings. Since the ptosis from the injury described may recover spontaneously, a year should elapse before surgical intervention. In the meantime, symptomatic amelioration can be secured by a ptosis crutch attached to the spectacle frame.

XANTHOMA DIABETICORUM

TO THE EDITOR:—*In THE JOURNAL, Nov. 8, 1958, page 1423, a question was asked on the management of xanthoma diabeticorum. The consultant's advice was to the effect that nothing but surgical treatment was available. Xanthoma diabeticorum, in common with other forms of xanthomas, can be influenced favorably by manipulation of the quantity and quality of fats. Some persons are markedly improved with elimination of most fats from the diet, and others show significant or complete improvement with substitution of polyunsaturated fat for saturated fat in the diet. The latter means is to be preferred in a diabetic patient and should be tried before the former is resorted to. The type of diet which may be used for this purpose is outlined by Olson and others (Am. J. Clin. Nutrition, 6:632, 1958).*

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The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

TO THE EDITOR:—*Surgical excision only of early small lesions was suggested and this at a risk of recurrence. The present histopathological interpretation of this condition has been altered since its original designation as necrobiosis lipoidica diabeticorum. It might better be termed necrobiosis diabeticorum, dropping the lipoidica, since it is no longer considered a true xanthoma. In 80% of these patients there is some form of diabetic association, with a likely ensuing relationship in the rest. Histologically the lesion is essentially a necrobiosis of the collagen. Lipids are present in the tissue, but the disease is ordinarily unassociated with systemic involvement of lipid metabolism. One exception is in diabetics with lipemia which in some instances may be accompanied by hypercholesteremia. In view of this, it is unlikely to assume that the type of diet referred to would be of much value in producing resolution of these lesions. In the experience of most dermatologists, diet has not been worthwhile in this disease. It is pertinent, however, to suggest that the lesion of necrobiosis be definitely differentiated from true xanthomatous le-*

is associated with systemic lipid disturbances. Tests may be achieved by means of clinical, pathological, and laboratory data.

OBESITY AND HYPOGONADISM

TO THE EDITOR:—A question on obesity and hypogonadism appeared in THE JOURNAL, Aug. 23, 1958, page 2157, concerning an obese 14-year-old boy with a small penis, no male distribution of hair, and a basal metabolic rate of -19%. Several comments appear warranted. In the first place, the question is inadequate to allow a clear answer. No mention is made of presence or absence of testes, size of testes, presence of other secondary sex characteristics, skeletal proportions, or clinical features for or against hypothyroidism. These questions certainly require attention long before the patient is subjected to the expensive series of laboratory tests suggested in the answer. Moreover, certain important points are not considered in the answer. The wide range in age for the onset of puberty in normal boys must always be remembered. The odds are great that this boy does not have Froelich's syndrome. By implying that an endocrinopathy requiring treatment is present, the answer tends to perpetuate the common misconception concerning the fat boy in his early teens who has not yet entered puberty. The vast majority have no endocrinopathy and require no hormonal therapy.

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The above comment was referred to the consultant who answered the original question, and his reply follows.—ED.

TO THE EDITOR:—The answer was prepared on the assumption that the question contained all of the available clinical facts. The writer's comment on the reply is traditionally acceptable. On the other hand, detailed study of obesity in boys with delayed sexual maturation will from time to time unearth evidence that endocrine or hypothalamic dysfunction is present and that these patients do not always represent one end of a distribution curve of normals. The therapy as outlined induces genital maturation, allays the concern of the parents and patient, and, in conjunction with caloric restriction and increased physical activity, aids in control of body weight.

FIRST USE OF BLOOD TRANSFUSION

TO THE EDITOR:—While one should hardly expect a complete history of blood transfusion in the Question and Answers section, the answer to the query in THE JOURNAL, Nov. 29, 1958, page 1834, about the historic facts concerning blood transfusion and the use of plasma is misleading. One

can hardly dismiss the chief events in the development of blood transfusions if one mentions anyone but Richard Lower without mentioning Lindeman, who in 1912 used a syringe technique in place of the unsatisfactory vein-to-artery anastomosis, and Kimpton, who substituted paraffin-coated cylinders for syringes. Reference should be made to Hustin, who in 1914 laid the foundation for modern transfusion by the introduction of citrate as an anticoagulant. Lewisohn popularized this method by determining the proper dose of citrate and by using it enough times to establish the technique on a sufficiently firm footing to permit Pemberton to report in 1919 its exclusive use in the Mayo Clinic, at which time he had performed more than 1,000 transfusions by the use of citrate.

With respect to plasma, the first comprehensive report was made in 1939 by Tatum, Elliott, and Nesset, who reported a complete method of obtaining satisfactory plasma and its use in 191 patients. This report may be said more correctly to have popularized the use of plasma than did the paper by Elliott published three years earlier. His paper only gave a method, which was rather an awkward one, of obtaining plasma, and there is no indication of his use of it. Elliott was still uncertain that it could be used indiscriminately with nonhomologous blood groups. If Strumia began the use of plasma in Bryn Mawr Hospital in 1927, as stated by the consultant, the date has no significance in priority, as he did not reveal that fact in the literature until 1940, although a photograph of a chart published by Nicholson in 1936 indicated the use of plasma at Bryn Mawr Hospital in March, 1934, in one patient. In 1941, Strumia and McGraw published the fact that they had used dried plasma, but they discarded it in favor of frozen or lyophilized plasma, a fact revealed in a paper by Strumia, Wagner, and Monaghan in 1940. At present, any plasma not preserved for at least six months at room temperature would be considered dangerous.

Finally, no report on the historic events in the use of plasma would be complete without reference to the farce of a few years ago when the irradiation of plasma was declared by leading authorities to be a safeguard against homologous serum hepatitis. Standard medical journals carried advertisements by commercial firms to the effect that such plasma was the complete answer to this problem. A definitive answer to it is still lacking, despite the fact that it appears to be generally accepted that plasma stored at room temperature for six months is safe. Perhaps it is.

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